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PRACTICAL MEDICINE AND MEDICAL DIAGNOSIS

BY

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COLLEGE OF PHYSICIANS

METHODS OF DIAGNOSIS.
CASE-TAKING AND CASE-RECORDING.
MEDICAL THERMOMETRY.

WITH FORTY-ONE ILLUSTRATIONS.

EDINBURGH:
YOUNG J. PENTLAND.
1887.

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PREFACE.

THE following pages contain the introductory portions of a Course of Lectures on Practical Medicine and Medical Diagnosis, which I have for the past eight years delivered in the Extra-Academical School of Medicine, Edinburgh, and which were originally communicated, partly in the form of Clinical Lectures and partly as bedside Cliniques to the students of the University of Durham College of Medicine at Newcastle-on-Tyne.

23 DRUMSHEUGH GARDENS, EDINBURGH,
1st January 1887.

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PRACTICAL MEDICINE & MEDICAL DIAGNOSIS.

CHAPTER I.

INTRODUCTORY—METHODS OF DIAGNOSIS.[1]

THERE is no doubt a tendency on the part of every teacher to overestimate the importance of that particular department of medical science with which he has to do. But bearing in mind that tendency, I can with confidence affirm that there is no subject which is of more importance to you than that, the study of which we commence to-day.

In the capacity of general practitioners, that honourable career to which most of you will probably devote your lives, you will have to practice all branches of the profession, but the majority—the great majority—of your patients will be suffering from *medical* diseases. Obviously, therefore, it is of the greatest importance, both for your own success, and also for the welfare of the public, that you should enter into practice with a sound knowledge of *medicine*, and with the confident assurance that you feel yourselves able both to recognise and to treat *medical* cases.

But to acquire even a moderate knowledge of the *medicine* of to-day is no trivial undertaking. The subject is of vast extent—it is probably the largest in the whole curriculum—it is ever changing and continually and rapidly increasing. The preliminary difficulties which the student has to overcome in making himself familiar with the mere methods of clinical investigation, are much greater in the case of medicine than in the case of surgery. The surgeon has to deal chiefly with external parts, and is able to employ sight and touch as his most important means of clinical investigation. The physician, on the other hand, is more particularly concerned with the internal organs. He has sometimes to fall back upon more elaborate means of investigation, and has not unfrequently to rely upon hearing as his chief aid to diagnosis; and, as you will soon find, it is very much more difficult to train the ear and to learn to appreciate fine modifications of sounds, than to educate the senses of sight and touch. Add to these circumstances the fact, that the portion of the curriculum which is at present devoted to *medicine* (clinical and systematic) is far too short, and I think I have said enough to show you that you have no light task before you. It is essential, therefore, that you should lay down for yourselves a well considered plan of study; and that you should apply yourselves to the work with the diligence and perseverance which have always characterised the students of this great school, and which are specially characteristic of the Edinburgh student of to-day. And this leads me to speak of the circumstance which induced me to give this course of lectures, and of the kind of instruction which you will derive from it. I well remember the feeling of bewilderment and uncertainty with which I commenced the study of *medicine* (medicine as distinguished from surgery) in the wards of our Royal Infirmary, now a considerable time ago; and although I had the inestimable advantage of attending the *clinique* of one of the most distinguished clinical teachers of that day—I refer to the late Professor Sanders—it was some time before I could fully profit by his instruction. I often thought, at that time, how useful to me a course of medicine, such as I propose to give you during the present session, would have been. On coming back to Edinburgh, I put my student notion into practice, and I am glad to know, from the large number of students who are present here to-day, that the course is appreciated by you. Let me add, that no effort on my part shall be wanting to make the lectures a thorough and complete success. It is a serious thing to be a teacher, and as each year comes round, I feel more deeply sensible of my responsibility. The primary object of a teacher of medicine is, of course, to impart sound instruction to his students, to convey to them such knowledge as will be of real use to them in their future career as practitioners of medicine, not forgetting altogether—though this, in my opinion, is a matter of very secondary importance, for I consider that the grand subject of medicine is prostituted, if lectures are allowed to degenerate into a mere ‘cram’ course—their present needs and the requirements of the Examining Bodies. But while this is his main object, that teacher would, in my opinion, fail in his duty to his profession, and would fall far short of what my ideal of a teacher ought to be, who did not endeavour, both by precept and example, to arouse the enthusiasm of his students, and to send them forth into the world, not only able, but ardently desirous of making original observations, and of adding to the common stock of knowledge. I earnestly hope that *I* may succeed in arousing *your* enthusiasm, that I may number among my class some, at least, who will attain to future distinction, and that all of you may look back upon this course of lectures as not the least profitable and pleasurable part of your curricula.

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[1] Being an introductory lecture to the Author's Summer Course of Practical Medicine and Medical Diagnosis in the Extra-Academical School of Medicine, Edinburgh.

Plan and Scope of the Course.—The instruction I propose to give you will be as practical as possible, and will relate more to the diagnosis than to the treatment of disease.

I shall, in the first place, describe to you the method of investigating and recording medical cases *(Case-taking and Case-recording).* I will next consider the important subject of the body heat or temperature *(Medical Thermometry).* I will then take up the examination of the various systems and organs in detail. In treating this part of the subject, I will :—

(1) Briefly recall to your memories the medical anatomy and the physiology of the organ under consideration.

(2) Describe the clinical methods by which we ascertain the condition of that organ, giving you a detailed description of the instruments employed in the investigation of medical cases, their mode of application, and the information to be derived from their use.

(3) Point out the normal physical signs, *i.e.* the signs appreciable to the senses (unaided and aided) of the physician, which result from the physical condition of the organ in its healthy state.

(4) Consider the pathological physical signs, *i.e.* the signs which result from the physical condition of the organ when diseased.

(5) Detail the more important abnormal sensations or symptoms, which the patient feels as the result of such pathological conditions, taking care to explain, whenever it is possible, the relationship of the symptoms to the lesion, *i.e.* the manner in which the lesion produces the symptoms.

(6) Tell you how the different disorders and lesions are to be distinguished *(Diagnosis and Differential Diagnosis).* This will constitute a considerable, and an important part of the course.

If time permits, I will (7) indicate the points to which attention is to be directed in forming the prognosis; and (8) enumerate the chief indications for treatment.

A course of lectures of this description would be very incomplete without practical instruction. I shall therefore divide the class into small sections for practical tutorial work; and will in this manner give you the opportunity of making yourselves practically familiar with the methods of investigation, and with the different instruments used in clinical research.

Importance of Practical Knowledge.—The kind of knowledge which I shall do my best to communicate to you in this course of lectures is, in my opinion, of the first importance to the student. As I have already said, medicine is a vast subject, and it is quite impossible for any of you to hope to *master* (*i.e.* to get a real, sound, and personal knowledge of) all the details of individual diseases during the brief period of the curriculum. The time has, I think, now come either for extending the period of study—an extra year devoted to the final subjects would be highly advantageous—or, if that cannot be done, it would be better, I think, to limit the subjects required for the purposes of examination—more especially some of the preliminary subjects—and to demand a thorough knowledge of the great principles of medicine, and of all the common and important medical affections, rather than an imperfect smattering and 'cram' knowledge of the whole.

While, therefore, I am of opinion that too much detailed knowledge of rare and obscure affections should not be required for the purposes of a pass examination, I think, and think most strongly, that no student should be allowed to enter practice who is not thoroughly versed in the details of clinical investigation and of clinical work, and who is not practically familiar with all the more important instruments, such as the laryngoscope, the ophthalmoscope, the electric battery, etc., which are used in medical research. Unless you acquire this sort of knowledge during your student days, you will probably never acquire it; and unless you possess this knowledge, you will not be so well fitted, as you otherwise would be, to add to the science and progress of medicine. Some of you may perhaps say, 'but we intend to be general practitioners, and what opportunity shall we have of making original observations.' Believe me—and I speak from some years' active experience as a general practitioner—your opportunities will be great. To mention one point only, the general practitioner sees disease from its commencement, he has, consequently, better opportunities of ascertaining its causation than the hospital physician, to whom cases are brought in their later and more developed stages. Hence the general practitioner is much more likely to discover the means by which diseases can be prevented, and I need not tell you that 'prevention is better than cure.' If you enter into practice with the desire and determination to observe and record clinical facts you will find your work a pleasure, you will treat your patients much more satisfactorily, and you will get reputation and practice more quickly than if you looked upon your profession as a mere business and matter of routine.

Importance of a full and accurate Diagnosis.—Now, the great object of the physician is to cure disease, or if, as unfortunately too often happens, that be impossible, to relieve suffering and to prolong life. Treatment is therefore the point which we must always keep in view.

In order that our treatment may be rational and scientific, it is necessary in the first place to ascertain exactly, or as exactly as the present state of medical science will allow, the morbid condition or conditions which are present; in other words, to make a full and exact diagnosis.

A diagnosis is not a mere guess, but is *a logical conclusion based upon the facts of the case.* In making a diagnosis, our aim should be, not merely to give a name to the disease, but to take into account the special features which it presents in the individual case under observation, to ascertain, if possible, the exact character and extent of the lesion—for it is only after we have got this information that we are in a position to treat the affection satisfactorily and to judge of its probable duration and course.

The mere naming of the disease is, as a rule, an easy matter. Sometimes, however, even that is impossible, owing to the facts that in some cases the grounds for forming an opinion are insufficient (the symptoms and physical signs are imperfectly developed); and that there are probably some diseases whose clinical features are as yet unknown. I can give you no better illustration of the fact that the mere naming of the disease is not a diagnosis, than by referring to the term 'heart disease,' which is so frequently used both by the laity and also by the profession. Under this name are grouped many different conditions, and many different degrees of the same affection. Some forms of 'heart disease' are of the gravest possible significance; others may continue for years, but are apt to terminate in sudden death; others, again (and in this class we meet with cases in which the heart's action may be markedly deranged, and in which the sounds may be replaced by murmurs), are of comparatively trivial importance, some of them having no tendency to cause sudden death or to materially shorten life, and others being readily amenable to treatment. To include all these different conditions under a common term, which to both the lay and to the professional mind is of very serious significance, and to diagnose them all as 'heart disease,' is obviously highly unscientific and improper. In making a diagnosis in such cases, the physician endeavours to determine whether the cardiac derangement is organic or functional: and if it be organic, the exact character and extent of the lesion.

To correctly appreciate the special features of any given case, and to gauge the extent and tendencies of the morbid process, is much more difficult, and demands the highest skill of the experienced practitioner. In order to arrive at a correct conclusion on this point, it is necessary to be well acquainted with the characters which the disease usually presents, and to take into account not only the special features which are manifested in the individual case under observation, but also the constitutional peculiarities, and the pathological tendencies of the patient. It is impossible to insist too strongly upon the importance of studying the individual characteristics and peculiarities of each and every patient who comes under observation. Students, whose knowledge of disease must necessarily be in great part gained by listening to systematic lectures and reading systematic text-books, are very apt to ignore the personal element or 'personal equation' as it has been fitly termed, and to regard their patients as so many cases of this or that disease (pneumonia, typhoid, mitral regurgitation, for example), rather than as separate individuals, each with his special tissue and constitutional peculiarities, to which, so to speak, the disease is engrafted or superadded. The fallacy of such a mode of looking at disease becomes obvious enough when one gets into practice, and is, to some extent counterbalanced by clinical teaching, but it is necessary to emphasise it. The systematic lecturer and systematic writer must necessarily describe types of disease, rather than individual cases, and in order to be clear and intelligible, he must of necessity draw in his outlines sharply and clearly; a very little practical experience will show you that the hard and fast lines of the type pictures are being constantly departed from. Let me beg of you, then, to study the individual characteristics and peculiarities of your patients, and, while sparing no pains to make yourselves well acquainted with the type pictures which systematic teachers and lecturers describe, to study disease as it occurs in nature. It is only by the unwearied observation of disease at the bedside, and the study of the special features of each individiual case, by looking, in fact, not only at the lesion, but also at the individual affected by that lesion, that you can hope to acquire that broad and comprehensive grasp, without which no one can be a truly good practitioner. It may be impossible, owing to the very nature of the case, even for the most experienced and accomplished physican to make an ideal diagnosis, of the sort I have just indicated, in every case, but a minute and exact diagnosis should always be aimed at. In support of this proposition, I cannot do better than quote to you what Dr Gowers says in speaking of the diagnosis of the diseases of the spinal cord. He writes:—'A tendency is sometimes observed among many members of the profession to undervalue diagnosis. Our business is to cure disease, as far as we are able, and a fear has been expressed lest our study of exactness in diagnosis should be at the expense of precision in treatment.' 'It matters little,' it has been said, 'whether your diagnosis of a diseased condition is minutely exact, if you are able to cure it.' This is true, but a very superficial study of practical medicine will show that much diagnosis, which is of no direct avail for treatment, is essential for the diagnosis which enables us to treat successfully. Of all organs there are some diseases for which we can do little, there are others for which we can do much: but unless we are able accurately to distinguish the diseases of each class, we shall be unable to apply our skill where it will be effective. Moreover, there are examples of the same form of disease, in some of which the diagnosis is easy, in others most difficult. The diagnostic knowledge which is superfluous in one case, is essential in another.'[1]

The Basis of a correct Diagnosis.—I hope I have now impressed you with the idea, that you should in all cases do your best to make a full and exact diagnosis. Now, in order to attain this end it is necessary—

1. To have a sufficiency of facts.
2. To have the facts correctly observed and noted.
3. To give due weight to the individual facts, and to the manner in which they are grouped, and to draw the logical conclusion therefrom.

The facts of the case include—

(1) Certain *preliminary particulars*, viz., the age, sex, occupation, etc., of the patient.
(2) *The previous history*—
  (*a*) Of the present attack.
  (*b*) Of the patient's former health.
  (*c*) As to his social surrounding, habits, etc.
  (*d*) As to his hereditary tendencies (the family history).
(3) The *symptoms*,[2] *i.e.*, the morbid sensations experienced by the patient.
(4) *The facts observed by the physician*, including the objective symptoms and the physical signs.

The correct observation of the facts of the case.—In my next lecture I shall speak in detail of the manner in which the facts of the case are to be elicited (case-taking), but I may mention here, that the particulars on which the diagnosis is founded are derived partly, from the statements of the patient (the *oral* examination, as I am in the habit of terming it); and partly, from the direct observation of the physician himself (the *physical* examination). Both methods are difficult to learn, and it is only after considerable practice and experience that you can hope to observe and note the facts correctly.

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[1] 'The Diagnosis of Diseases of the Spinal Cord,' p. 1.

[2] Symptoms are usually divided into subjective and objective. *Subjective* symptoms are those abnormal sensations, such as pain and numbness, which are experienced by the patient, but which cannot be appreciated by the physician. Under the term *objective* symptoms, are included such obvious abnormal conditions as jaundice, swelling of the feet, etc., which are perceived by the physician, but which do not require any physical examination, properly so called, for their detection. The *physical signs*, again, are such facts as dulness on percussion, which the physician elicits by physical examination. It is preferable, I think, to include the objective symptoms and physical signs under the common term of *facts observed by the physician*. Jaundice, swelling of the feet, and other conditions which are detected by the aid of sight, are just as much physical signs as râles or murmurs, which may sometimes be observed by the unaided ear.

Let me urge you to use your utmost endeavours to elicit and record correctly the facts of the case. In these days of clinical and literary activity, one of the main lessons which the teacher should impress upon the student, is the *habit of careful, accurate, and truthful observation.* No one is a truly great clinical observer who is not scrupulously truthful and exact. Let me beg of you, then, from the very first to strive above all things to elicit and record the facts *as they are in nature,* and to be on your guard against seeing the facts in a false light, colouring them, and making them fit in to the supposed nature of the case. If there is one thing above all others which I desire to teach you,—and if I were to impress you with this one point only, and to teach you nothing else during the whole session, the course would not be altogether wasted—*it is to have in every clinical observation, however trivial, the most scrupulous regard for truth.*

The conclusion derived from the facts.—As I have already stated, due significance must be given to the different facts, and a logical conclusion deduced from them. Here, again, knowledge and experience are necessary to enable you to appreciate the relative importance of the different facts. Some facts are much more valuable than others. It occasionally happens that a single fact is itself distinctive; the presence of a diastolic aortic murmur, for example, indicates aortic regurgitation;[1] the presence of hooklets in the fluid drawn off from a cystic tumour proves that the cyst is an hydatid. Such facts as these, which are in themselves distinctive, are termed *pathognomonic.* But while such pathognomonic facts do occasionally occur, you must clearly understand that they are rare. The great majority of symptoms and physical signs are common to several diseased conditions. Pain is perhaps the most common symptom, and is seen in a vast number of different affections. Again, cough may be due to many different disorders; so, too, dulness on percussion over a portion of the chest, which is normally resonant, may result from various lesions.

It usually happens in every case, that we elicit some facts which are accidental and unimportant. In a case of pneumonia in an adult, for example, the fact that there had been an attack of scarlet fever in childhood would probably be of no importance whatever. In a case of mitral disease, on the contrary, a history of scarlet fever, a few years previously, might be of considerable value, for scarlet fever in some cases is attended with endocarditis, which may lead to valvular disease of the heart.

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[1] A diastolic murmur has been recorded in aortic aneurisms, independently of aortic incompetence; but it is so infinitely rare, that the statement in the text may be safely relied upon.

Speaking generally, the *facts observed by the physician* (objective symptoms and physical signs), inasmuch as they do not depend upon the mere statement of the patient, are of more importance than the symptoms (*i.e.* the subjective symptoms or sensations experienced by the patient). Due weight should, however, be given to the symptoms unless there is some obvious reason to the contrary. When the patient is manifestly exaggerating, when he is labouring under some mental derangement, or when there is a motive to deceive, the diagnosis should be almost exclusively based upon the physical signs. Women are more apt to exaggerate than men; but this tendency is seen in its fullest extent in the condition called hypochondriasis, in which the patient imagines that he is the victim of all sorts of dreadful complaints, magnifies the most trivial ailments in an extraordinary manner, and seriously believes that he is the subject of grave organic disease. In hospital practice it is no uncommon thing to meet with patients who feign disease. These 'malingerers,' or, 'hospital birds,' as they are called, pass from one hospital to another, and keep a roof over their heads by their deceit. It often requires considerable acumen to detect them. Malingering is, as we all know, not uncommon amongst schoolboys; it is also frequently met with in soldiers, sailors, prisoners, the inmates of workhouses, and the like. In railways cases, too, we sometimes meet with gross exaggeration and shamming. We find persons who have been in a railway collision, but who have received little or no injury, taking to bed, laying up for weeks or months, and feigning to be seriously ill in order to exact heavy damages from the company. Hence it is that all railway cases are looked upon with more or less suspicion; a most unfortunate circumstance for those persons who are really hurt, for in consequence of this feeling of suspicion, which is attached to all railway cases, the genuine ones are often inadequately recompensed.

In other cases, on the contrary, patients who are the victims of serious organic disease, make light of their complaints. In phthisis, for example, a patient will daily tell you that he feels much better, when it is manifest to the most casual observer that he is rapidly getting worse; indeed, so frequent is this hopeful state of mind in pulmonary consumption, that a special name, the *spes phthisica*, has been given to it.

Young doctors, whose experience has been limited to hospital practice, and who start perhaps with an exaggerated notion of their powers of physical diagnosis, are apt to disregard symptoms. I know this from actual experience. The following, which I met with soon after commencing practice, is a case in point:—A man presenting all the appearances of robust health, and who was obviously not exaggerating, consulted me on account of pain in the left chest and back. Not detecting anything abnormal by physical examination, I pooh-poohed his complaints, and gave it as my opinion that there was nothing seriously the matter with him; soon afterwards he died suddenly, and on making a *post-mortem* examination I found an aneurism of the descending thoracic aorta. It had ruptured into the left pleural cavity, causing instantaneous death.

But while anxious to impress you with the fact that due weight should always be given to the symptoms, unless there is some strong reason to the contrary, I must not lead you to suppose that grave symptoms are necessarily present in every serious case; indeed, it occasionally happens that patients die who have manifested no symptoms, and made no complaints. Absence of symptoms in the presence of serious organic disease is seen more frequently in chronic than acute affections. In this case, for example (fig. 1), in which a small aneurism springing from the base of the aorta, just above the valves has ruptured into the pericardial sac, there were no symptoms during life. The patient was a butcher, who died suddenly in the street. During life he had presented all the appearances of robust and vigorous health; and so far as could be ascertained from his friends, had never made any complaint.

Occasionally, but more rarely, we see the same thing in acute affections. The preparation, which I now show you, is a striking illustration of this fact:—A girl, æt 17, who had previously enjoyed good health, but who had never menstruated, complained of uneasiness in the upper part of the abdomen, and of constipation. The tongue was slightly furred, the pulse a little quick, the bowels had not been relieved for a week, but there was nothing to direct attention to any serious disease within the chest. A dose of castor oil was prescribed. A few days after, I was suddenly summoned to the case, and found the patient dead. She had passed a somewhat restless night, but had got up to breakfast as usual; had suddenly complained of feeling faint, and had fallen back dead. All the organs were healthy with the exception of the heart. The pericardium was distended with turbid fluid, and both surfaces—the parietal and visceral layers of the sac—are, you will see, coated with recent lymph (fig. 2, p. 12). The case was one of pericarditis; syncope the cause of death. On inquiry I ascertained that she had waded in the sea a fortnight previously, and for some days afterwards had been a little hoarse. There was no history of rheumatism. So trivial were the symptoms in this severe and acute case, that the patient was able to go about her work, that of a baker's assistant, until two days previous to her death. The case is a very interesting one, being an example of a rare disease—*latent* pericarditis, which was apparently *idiopathic*.

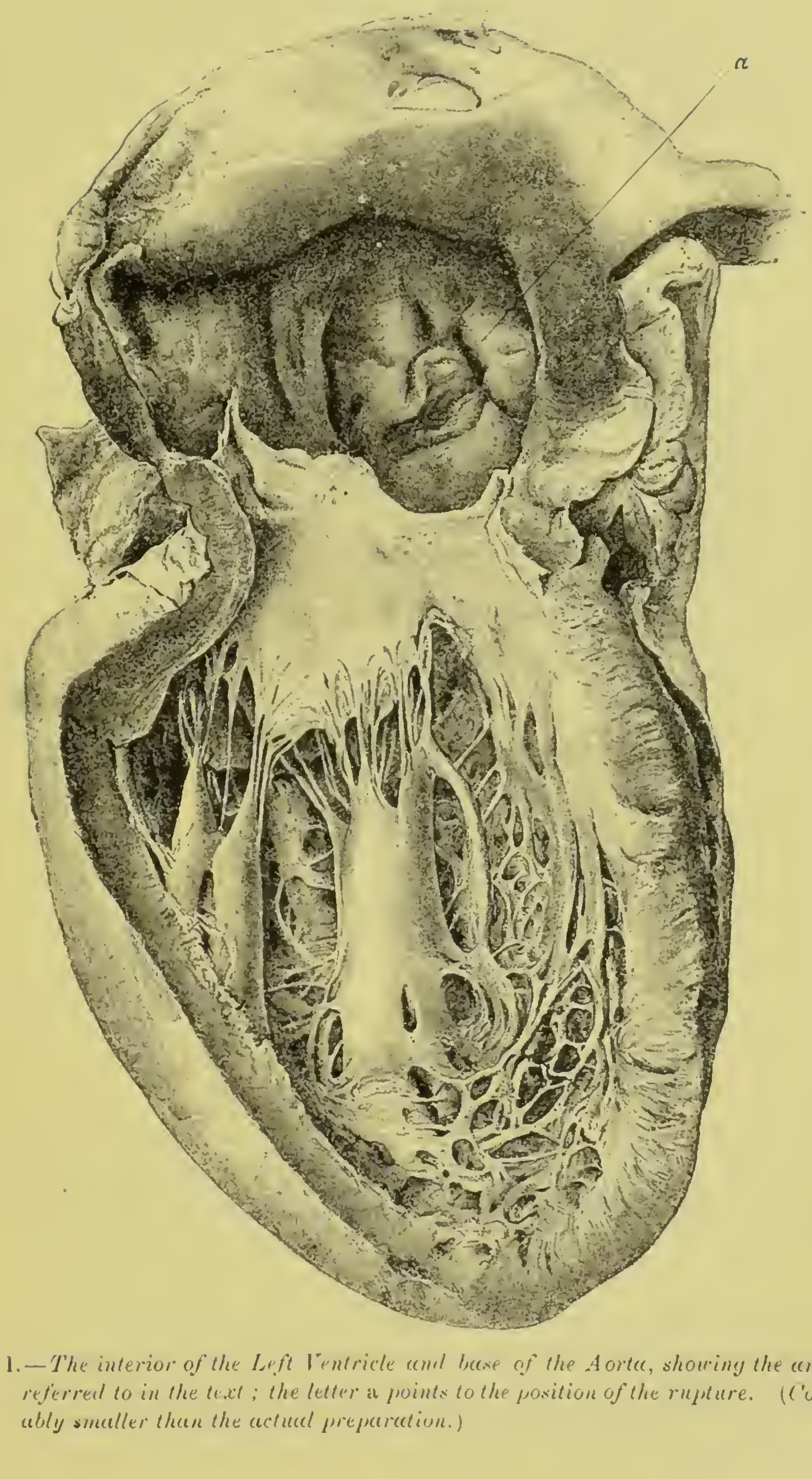

FIG. 1.—*The interior of the Left Ventricle and base of the Aorta, showing the aneurism referred to in the text; the letter* a *points to the position of the rupture. (Considerably smaller than the actual preparation.)*

I have now detailed to you the ordinary means by which we arrive at our diagnosis, viz., by the *method of deduction.* In some cases we employ another method, viz., the *method of exclusion or negation* When, for example, the facts seem to point to several, say four, different affections without indicating any one of them in particular, we endeavour to find some symptom which negatives or contradicts, and so excludes one of the four; the same process is again, if possible, repeated, and so on, until three of the four are excluded, and one alone remains. This method of negation is of value in some difficult cases, but, 'it is a roundabout method' *(Da Costa)*, and is not adapted for general use.

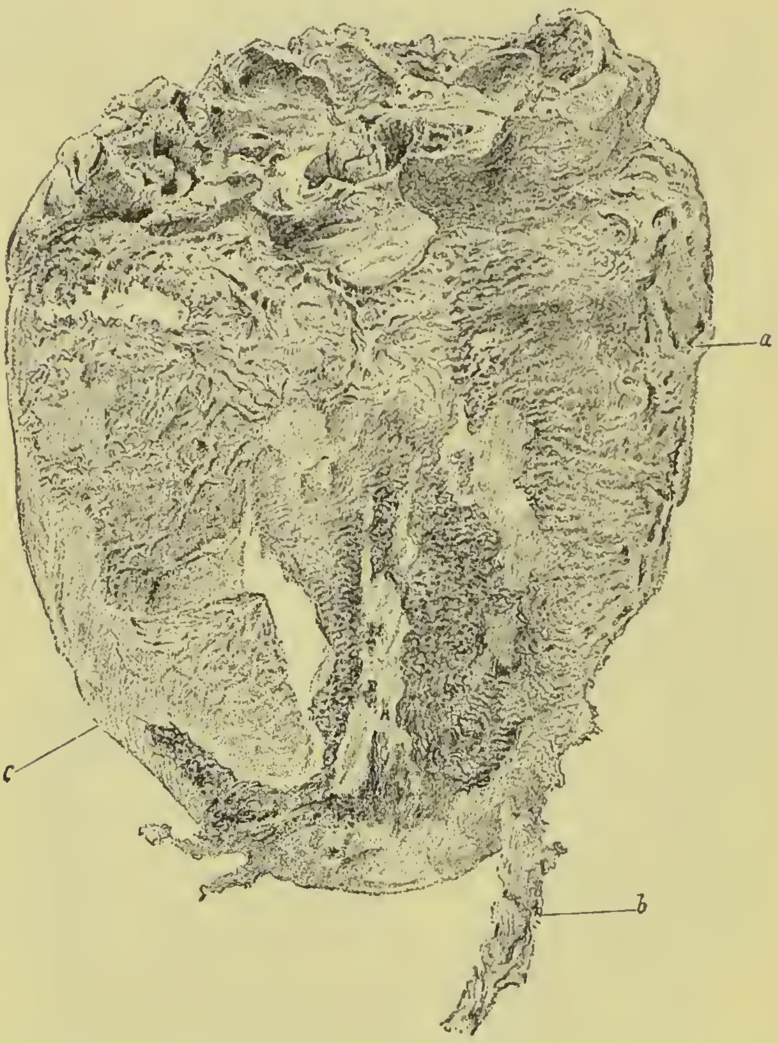

FIG. 2.—*The heart from the case of pericarditis referred to in the text;* the letter *a* points to a portion of the heart covered by rough, recent lymph ; *b*, to a detached shred of lymph ; *c*, to a portion of the heart from which the lymph has been removed.

It should only be employed when the deductive method seems to fail. It is, too, an uncertain method, for, in using it, we must be quite certain that we have excluded all the possible conditions except one. If, for example, in the case I have supposed, there should be five instead of four possible affections, and if we have omitted to think of and take into account the fifth, that one (the fifth) may be *the* affection, and our conclusion will of course be false.

In other cases, again, we have recourse to therapeutics in order to clear up the case (we make a *therapeutic diagnosis).* In a case of supposed abdominal tumour, for instance, if, after giving chloroform, we find that the tumour disappears, we at once conclude that it is not a tumour in the ordinary acceptation of the term, but a 'phantom growth.' Or again, suppose the symptoms and physical signs clearly point to the presence of an intra-thoracic tumour, but are insufficient to enable us to say whether it is an aneurism or a solid growth; if after giving full doses of iodide of potassium combined with absolute rest, we find a marked improvement in the case, we should (speaking generally) be justified in deciding in favour of aneurism, for the symptoms caused by aneurisms are, usually, materially benefited by this treatment, but those due to solid intra-thoracic growths, which in the great majority of cases are malignant lympho-sarcomata, are not.

Then again, in other cases, we have to fall back upon the *theory of probabilities, i.e.* the numerical chances in favour of one or other of two conditions. Suppose, for example, that a female patient came to us complaining of swelling of the abdomen, and that on examination we found that the cause of this distention was a large cyst; the numerical chances would be very strongly in favour of an ovarian tumour; and unless there were some strong reason to the contrary, the fact should be allowed due weight. In the great majority of cases in which we followed the numerical chances and diagnosed an ovarian tumour, our conclusion would be correct. The following is a case in which it was wrong:—A married woman, æt 33, was admitted to the Newcastle-on-Tyne Infirmary, under my care, on June 20th, 1877, suffering from great distention of the abdomen. She stated that she had enjoyed excellent health until two years previously, when she began to suffer from pain in the abdomen, just above the right groin, and noticed that the lower part of her belly was swollen. The swelling, which was at first about the size of an orange, gradually got larger, and rapidly increased in size after the birth of her last child, which took place on April 1st, 1876. Of late her general health had deteriorated, and she had lost flesh. She had been married for thirteen years, and had had nine children. She had not menstruated since her last pregnancy.

She was pale, sallow, and somewhat emaciated. The *digestive, respiratory, circulatory, urinary, nervous,* and *integumentary* systems seemed natural. The abdomen was largely and uniformly distended; it measured 41 inches at the umbilicus. The skin was somewhat tense, and the veins in the anterior abdominal wall were slightly visible. The front and sides of the abdomen were dull on percussion. There was some resonance in the left hypochondrium. On palpation, the outlines of a large tumour extending from the pelvis below, to the lower margin of the right ribs above, could be distinctly defined, and in addition some free fluid in the cavity of the peritonæum was detected. Distinct and independent fluctuation was perceived in the large tumour. There was tenderness on palpation over the cyst. On vaginal examination the uterus was found to be of normal size; a round elastic tumour about the size of an orange was felt in Douglas's pouch. Owing to the great distention of the abdomen, the abdominal viscera were displaced upwards, but the size of the liver was not, so far as could be ascertained, increased. From these physical signs it was evident: (1) That the distention of the abdomen was due to the presence of a large cyst; (2) That there was some free fluid in the cavity of the peritoneum. (3) It was further concluded that the cyst was ovarian; this opinion being based upon relation of the cyst to surrounding parts, the very distinct history, which the patient, an intelligent woman, gave of its growing upwards from the lower part of the abdomen, and upon the numerical chances of the case.

On June 23rd she was attacked with subacute peritonitis. There was pain over the greater part of the anterior abdominal wall; and very distinct friction could both be felt with the hand and heard with the ear over the same parts.

On July 6th the pain was easier; the abdomen had increased in size, and now measured 44½ inches.

About this time the patient was seen in consultation by my colleague, Dr Arnison, to whose care she was transferred on July 9th. She was then, as indeed she had been all along, very anxious to have the cyst removed. Dr Arnison subsequently operated. On opening the abdomen it was at once evident that the tumour was an enormous hydatid which extended from the liver above, deep down into the pelvis below. Several smaller cysts were attached to the larger one, and it was one of these which had been felt *per vaginam.* The patient unfortunately died from peritonitis, a few days after the operation, and the body was removed from hospital before a *post-mortem* examination could be obtained. The exact point of origin and connections of the hydatid were not ascertained.

In order to arrive at a full and exact diagnosis, we are in the habit of advancing by the following steps or stages :—

Step No. 1. In the *first* place we endeavour to *determine the particular system and organ which is primarily affected.* This is generally easy, although in some diseases, as in typhus fever for example, we are unable to localise the lesion in any special part.

Step No. 2. Having determined the system and organ which are affected, we next endeavour to *ascertain the exact extent of the lesion, i.e.* to make an exact anatomical diagnosis, *firstly,* by making a minute physical examination of the affected organ, in the manner which I shall describe to you when I come to speak of the physical examination of the different systems and organs in detail. *Secondly,* by observing the effects which the lesion has produced on the affected organ itself; on the other parts of the physiological system to which it belongs; and on the economy as a whole. In stenosis of the mitral valve, for instance, we try to gauge the extent of the lesion by observing :—the secondary alterations which have resulted in the size and shape of the heart; the loudness of the pulmonary second sound (*i.e.* the condition of the blood tension in the pulmonary artery); the amount of engorgement of the systemic venous circulation, and the consequences which result from it, the exact condition of the arterial system, etc. *Thirdly,* by observing the exact nature of the symptoms; in some affections, more especially in some diseases of the nervous system, by paying attention to this point, we obtain very valuable information as to the exact position and extent of the lesion.

Step No. 3. Having formed an opinion as to the organ affected, and the exact extent of the lesion, we next endeavour to determine the pathological process, which is at work; and in trying to make a *pathological diagnosis* we take the following points into account :—

1. *The particular organ and parts of that organ which are affected.*

As a matter of experience we know that certain organs or parts of organs are liable to be affected by certain pathological processes :—consolidation of the apex of the lung, for example, is very generally tubercular; a solid tumour of the body of the uterus is, in the great majority of cases, a 'fibroid;' a chronic lesion limited to the posterior columns of the spinal cord is usually the sclerotic lesion of locomotor ataxy; an irritative 'coarse' lesion on the surface of the brain is in most cases tubercular or syphilitic; paralysis of the extensor muscles of both forearms (double wrist drop) is almost invariably due to lead poisoning.

2. *The character of the physical alteration produced by the lesion.*— This can only be determined in exceptional cases. In the case of the lungs, for instance, certain lesions give rise to dulness on percussion

If, then, we detect the presence of dulness we narrow the limits of the inquiry.

3. *The nature of the symptoms.*—Deep-seated pain in the back, for example, occurring in an adult, and not attended by any marked disturbance of the general health, would be very suggestive of an aneurism.

4. *The mode of commencement of the attack, and the course of the case, especially the acute or chronic nature of the affection.*—This is a most important aid in arriving at the pathological diagnosis. When, for example, we find consolidation over the base of the lung, and when we know that it is of recent origin (*i.e.* acute), we can definitely exclude solid intra-thoracic growths. So, too, in a typical case of permanent hemiplegia, if the onset were sudden, we should conclude, as the result of experience, that the pathological process was in all probability either extravasation of blood into the brain substance (hæmorrhagic apoplexy), or plugging of a cerebral vessel.[1]

The *exact mode of onset* is also sometimes important. In a case of hemiplegia, if the paralysis followed an epileptic fit of the localised (Jacksonian) type, we should probably be correct in concluding that it (the hemiplegia) would be of temporary duration, and further, that the pathological process at the root of the mischief would in all probability be a localised 'coarse' intracranial lesion (tumour or localised meningitis).

When considered in conjunction with the exact anatomical diagnosis, the mode of onset is often quite conclusive. We know, for instance, that sudden paralysis of the lower extremities in a child, characterised by flaccidity, rapid atrophy of the muscles, and unattended by sensory derangements, depends upon an acute inflammatory process in the anterior cornua of the spinal cord.

5. *The presence of associated diseased conditions.*—In the case of a doubtful intra-thoracic growth, the presence of tumours in other organs or parts of the body, would show that the intra-thoracic disease was a malignant growth. So, too, in chronic Bright's disease, the presence of a solid and uniform enlargement of the liver and spleen, would strongly point to the lesion being 'waxy.' Again, in a case of intracranial tumour, the presence of associated scrofulous disease of the glands, lungs, or joints, would indicate that the central lesion was of a similar pathological character.

6. *The age of the patient.*—Certain pathological processes are common at one period of life, but rare at others. In some cases this fact may help to decide the pathological diagnosis. Deep-seated pain in the back, for example, in a young subject, would probably be due to caries of the

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[1] I say a typical case, for in hysteria we sometimes meet with sudden hemiplegia (presenting certain peculiarities however) which may last for a long time.

vertebræ (Pott's disease). Pain in the same situation, during active manhood, might result from the presence of an aneurism; in an old person, from malignant disease of the spine.[1]

In addition to the points I have already mentioned (1, 2, 3, 4, 5, and 6), the following circumstances are sometimes helpful in deciding the pathological diagnosis:—

7. *The occupation of the patient.*—A rapid attack of ill-developed pneumonia with fever, ending in death, *in a woolsorter*, would suggest anthrax. Headache, convulsions, and double optic neuritis, a combination of symptoms which is usually indicative of an intra-cranial growth, would, *in a white-leadworker*, suggest plumbism.

8. *The abode of the patient.*—A cystic tumour of the kidney, if it occurred in Iceland, would probably be diagnosed as an hydatid, for hydatid disease is very prevalent in that country; neuralgic affections occurring in places where ague is endemic, are very often due to the malarial poison; and so on.

Errors in Diagnosis.—Before concluding these remarks, it may perhaps be useful to point out the chief sources of error in arriving at a full and correct diagnosis. In the *first* place, then, a diagnosis may fail through *insufficiency of facts.* The facts may be actually wanting. In the earlier stages of a febrile attack, for instance, it may be impossible to come to a definite conclusion; under such circumstances we must be content to make a *provisional diagnosis*, and to wait for the appearance of additional facts. Again, the facts may be insufficient owing to the information supplied by the patient being defective; some patients wilfully conceal facts; others cannot furnish the necessary facts owing to their being children, foreigners, speechless, comatose, or affected with some mental derangement. In such cases we have to fall back upon the friends for many particulars, and if, as it may happen, there are no friends, we must rely on the physical examination alone. In cases of this description, the grounds for forming an accurate opinion may be insufficient. This is one of the sources of difficulty of diagnosing simple affections in lunatics.

In the *second place*, a diagnosis may fail *through the incorrect or erroneous observation of facts.* The patient may wilfully deceive you, or your own observation may be at fault.

Defective or incomplete observation on the part of the physician, is a fertile source of error, especially in young practitioners. In a case of dropsy, for instance, the urine is found to be albuminous, and it is an easy and common error to conclude that Bright's disease is the cause of the dropsy. In many of these cases more careful and complete examination will show that the albuminuria is simply the result of congestion of the kidney; and that it and the dropsy depend upon a mitral lesion. I have again and again known such mistakes made in practice. I must ask you then, to remember, that because you detect one lesion, it by no means follows that there is no other lesion present; owing to neglect of this precaution, complications and secondary affections are often mistaken for the primary disease.

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[1] This does not of course imply that malignant disease of the vertebræ does not occur in young persons, or that old people do not suffer from aneurism or caries.

You should, too, remember, that in the course of the case new facts are apt to appear which may cause you to modify or add to your diagnosis. One is very apt, after having thoroughly examined a case and formed an opinion, to stick to that opinion, and to see everything else which subsequently appears in the same light. Again, unless we occasionally thoroughly re-examine the case, we may fail to observe the new facts which are developed. Such omissions lead occasionally to unfortunate results. In a case of chronic disease, for example, the friends may desire a consultation. The consultant thoroughly examines the case, and detects something which has escaped your notice, simply because you have not looked for it. Such mistakes are very vexatious. The consultant will probably form an erroneous estimate of your skill; if he is inclined to 'score' and make much of his own powers of observation, you may possibly lose the confidence of your patient. And here let me say, that when called in as consultants,—while, on the one hand, it is your duty to state honestly and fearlessly the opinion you may form as to the nature of the case; on the other hand, you must give due weight and consideration to the opinion of your professional brother, you must take care to state your own views as pleasantly as possible, and to avoid bringing into relief any omissions you may have noticed, and never, on any account, attempt to magnify yourself at the expense of your colleague. Remember, then, both in hospital and private practice, to re-examine your cases, and to revise your opinions. You will, too, find it a useful practice, whenever a patient or his friends are anxious to have another opinion, to go thoroughly over the case a short time before the consultation comes off.

In the *third place*, though the facts are sufficient and have been correctly noted, you *may fail to give them the proper weight, or may draw an illogical conclusion from them.*

Sometimes, as I have already told you, we are unable to decide what is the nature of the case. Now, it is seldom, if ever, advisable for a young doctor to tell a patient in so many words, 'I don't know what is the matter with you.' The laity do not understand the difficulties which in some cases surround the diagnosis. If you tell your patients that the case beats you, they will probably go somewhere else. In such cases much tact is sometimes required to satisfy the patient without committing yourself. If, however, you are asked by a professional man, say in consultation, for your opinion in a case of this description, you should always clearly state your difficulties and doubts. To pretend to knowledge which you do not possess, or to attempt to gloss over the obscurities of a case, is simply one form of quackery.

Finally, let me urge you to avoid hasty conclusions, to form your opinion slowly and maturely; but, once you have made up your mind as to the nature of the case and as to the treatment you should adopt, to adhere to your opinion, and only to change it when you are satisfied that there is good reason for doing so. Firmness and decision are essential for great success in practice. There is nothing which is more injurious than indecision. The man who is constantly changing his opinion and his treatment, will never command the confidence and obedience of his patients. Now it is impossible to possess the right sort of self-confidence, to act with the right sort of firmness and decision, unless you feel yourselves thoroughly up in your work. I hope that the Course of Lectures which we commence to-day, will enable you to some extent, at least, to attain that end.

CHAPTER II.

CASE-TAKING AND CASE-RECORDING.

CASE-TAKING.

THE object of any method of case-taking is to ascertain '*the facts of the case*,' in other words, to obtain the data on which the diagnosis, prognosis, and treatment are founded.

The facts are elicited partly by means of the oral or *vivâ voce*, and partly by means of the *physical* examination. Both methods are difficult to the beginner, and can only be thoroughly mastered by practice and painstaking effort.

The oral examination.—The oral naturally precedes the physical examination, and consists of the preliminary statement which the patient volunteers regarding his illness and complaints, and of the statements which he makes in answer to the questions and cross-questions of the practitioner.[1]

In many cases of acute and serious illness it is necessary to limit the oral examination to a few leading questions, and to proceed to the physical examination forthwith.

The beginner naturally feels considerable difficulty in conducting the oral examination, for, not knowing what to ask, being ignorant of the relative importance of different facts, and of the relationships and co-relationships of disease (the bearings which one morbid process has upon another), he collects a confused mass of facts, the majority of which are perhaps unimportant, and it may be altogether irrelevant. The conducting of the oral examination—the questioning and cross-questioning the patient—is in fact an art which only can be acquired by long practice; moreover, to excel in this method of examination it is necessary to have a thorough knowledge of disease. The oral examination must be conducted with order and in accordance with a definite plan; each question should have its point, and should be as simple, precise, and intelligible as possible; leading questions should, with some exceptions

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[1] It is seldom possible to complete the oral before commencing the physical examination. The latter usually reveals facts which suggest questions relating to the previous state of health. Some authorities, therefore, recommend that the inquiry into the previous history of the case should be delayed until the physical examination has been completed. This point is again referred to. (See p. 38.)

(as, for instance, when the patient is very ill or stupid), be avoided, and the physician must not hesitate to check the volubility of the patient, and to see that he restricts himself to the matter in hand.

The volubility of the patient.—With most patients the difficulty is, not to get information, but to limit the statement to matters which are of real importance. The experienced practitioner, who is skilled in the art of cross-examinination, and whose knowledge of disease enables him to limit the volubility of the patient, is able in a comparatively brief space of time to elicit all the important facts; while the conscientious clinical clerk, who is anxious to do his best and get every particular, may perhaps, at the commencement of his medical work, spend hours in eliciting facts, many of which being utterly useless or irrelevant, should be omitted from the record, and may fail from want of knowledge of the relationship of diseased processes to ascertain facts of the first importance. Knowledge of disease should, in short, guide the examination throughout, the nature of the patient's answers suggesting the questions of the practitioner. In a case of dropsy, for example, it is important to ascertain whether the swelling commenced in the face or the feet, for renal dropsy is usually first observed about the eyelids, while cardiac dropsy generally commences in the feet; again, when cardiac valvular disease is present, a previous history of acute rheumatism should be inquired for; when there is a chronic enlargement of the spleen, it is important to ascertain whether the patient has suffered from malaria, etc.

Leading questions should, for the most part, be avoided. When, for instance, the patient complains of pain, it is better to ask him *where he feels the pain*, telling him to place his hand on the painful spot, rather than to ask him if he has pain in this or that particular part. Some patients, when questioned according to the latter method, will tell you that they have pain in almost every part of the body; when asked, for example, 'Have you pain in the stomach?' they will answer, Yes. 'Have you pain in the chest?' Yes. 'Have you pain in the head?' Yes. Again, some patients are ignorant of the exact meaning of words and terms, and so give misleading answers. A pain in the chest, for example, may mean a pain over the region of the stomach; a pain in the stomach may mean a pain in the lower part of the abdomen, etc.

Difficulty of obtaining information.—It is sometimes difficult or impossible to obtain information by means of the oral examination; in some cases this is owing to the reticence, bashfulness, or stupidity of the patient; in others, to the wilful suppression of facts; in others, again, to inability to comprehend or answer the questions of the practitioner. In cases of this description the practitioner has to fall back for information upon the relations or friends of the patient. When no such information is forthcoming, the difficulties of arriving at a correct diagnosis are much increased.

The physical Examination.—After having so far as possible completed the oral examination, the observer must next endeavour to determine the exact physical condition of the body as a whole, and of its various systems, organs, and parts. For this purpose, all the senses, more especially sight, touch, and hearing, but in some cases also smell, taste, and the power of appreciating weights (the muscular sense), are called into requisition; and special instruments and means of research (which aid or increase the power of the senses, which demonstrate the physical or electrical condition, or graphically record the action of organs and parts, and which enable us to determine the physical and chemical constitution of the various secretions and excretions) are employed.

The great importance of the physical examination, the difficulties which beginners have in employing the unaided senses so as to correctly observe and truthfully describe simple physical conditions, and the necessity of acquiring a thorough, practical knowledge of the various instruments and means employed in clinical research, have already been insisted upon. But while it is impossible to over-rate the importance of acquiring the power of correct observation and of making oneself familiar with all the aids to clinical research, it is essential to remember that a large practical acquaintance with disease, and a knowledge of the relationships of different pathological conditions, and of the connection of clinical symptoms with pathological and physical states, in fact a knowledge of what to look for and what to expect, are as essential as guides and directors of the physical, as of the oral examination. No one, in short, can be a really good, much less a truly great, clinical observer, who has not had a large practical clinical experience.

Before describing the details of case-taking, it may perhaps be well to direct attention to certain general rules which should always guide the conduct of the practitioner. They are as follows:—

1. *Take care not to adopt any method of examination which is likely to injure the patient.* Patients, for example, who are very ill, should not be subjected to the same detailed and prolonged examination, as the general run of chronic cases. In hospitals connected with large medical schools it is essential to see that patients are not over-examined—a point which has been specially insisted upon in our Royal Infirmary, where, in some of the wards, the number of students and clinical clerks is altogether disproportionate to the number of patients.

2. *Take care, in making both the oral and physical examinations, not to do anything which is likely to offend the delicacy of the patient.*—The only reason for directing attention to this rule, which insensibly guides the conduct of all right-thinking men, is to point out that no examination which the practitioner is called upon to make, is in itself indelicate, provided that it is necessary and made in the right spirit. Young practitioners are sometimes apt to forget this. I have met with cases in which a mistaken idea of delicacy has led to errors in diagnosis, by interfering with the thorough investigation which the circumstances of the case required.

3. *Endeavour at the outset to gain the confidence, esteem, and respect of the patient.*—The importance of gaining the full confidence and trust of the patient is so obvious—both with the object of getting full information regarding his illness and complaints; for the purposes of treatment (for in many cases the mere impression produced on the mind of the patient by the presence of the practitioner, and by a hopefully expressed and confident opinion, is far more powerful as a curative agency than all the drugs of the pharmacopeia); and indeed for one's whole success—that it need not be further insisted upon. The man of average ability who acts with courtesy and kindness tempered with firmness and decision, who takes a sympathetic interest in the complaints and sufferings of his patients, who regards them not merely as so many cases of this or that disease, but as fellow-creatures, doing to them as he would wish to be done by, need have no fear as to his success.

4. *Do not be in too great a hurry to commence the physical examination.*—Many patients, more especially women and children, are considerably disturbed by the entrance of the doctor; care should be taken to allow their agitation to subside before the pulse is felt or the examination commenced. A little time, a few general remarks, and above all, a self-possessed and confidence-inspiring manner and address, are usually all that is required.

5. *Never ask the same question twice.*—Mr Syme, from whom I learned this rule, used to point out that if the same question is asked twice, the patient is very apt to think that the practitioner's thoughts have been wandering, and that he has been giving no attention to his statements and complaints. Without doubt such a conclusion would, in many cases, be correct. Fortunately it is not, as a rule, hard to get out of the difficulty. Whenever I have made such a mistake I have at once perceived my error, and have, as a rule, been able to cover my retreat. When, for instance, I have, through forgetfulness, asked the patient to show his tongue a second time, I have, perceiving

my mistake, told him to push it well out in order that I might see the back.

6. *Never be surprised at anything.*—This was another of Mr Syme's aphorisms, which on more than one occasion has stood me in good stead. The following case, for example, is in point:—Soon after entering practice I had occasion to prescribe strychnia for a nervous case; the dose was a full one, and through a mistake on the part of the patient, was still further increased. In the course of a few days muscular twitchings appeared. I was called to the patient, and learned that he had had some indications of a fit. At once recognising the state of matters, and remembering Mr Syme's aphorism, I was enabled to keep cool, and to assure the friends that there was no danger, telling them at the same time that, owing to the appearance of the new symptoms, the medicine which he had been previously taking must be at once discontinued and another substituted. It is needless to say that the alarming symptoms soon subsided; the case proceeded exactly as I had predicted, and I actually gained some credit and reputation from an accident which caused me considerable anxiety.

CASE-RECORDING.

It is impossible to over-estimate the value of full and accurate records. The mere act of recording the case conduces greatly to completeness and accuracy in the examination; in many cases it is only after the case has been taken, and when the notes are being read over, that omissions are noticed; while for future reference and scientific purposes, the full and accurate recording of cases is absolutely necessary. In private practice it is impossible for the busy practitioner, single-handed as he is, to take notes of all his cases, but much more can be done than is usually attempted; and I would strongly advise all who take a real and scientific interest and pleasure in their profession, to endeavour to keep good notes of all their more important and interesting cases. I look back with pleasure to the records of some of my cases taken in private practice, but I also regret many omissions, the records of which would now be of value to me. In private practice one is very apt to allow cases to pass unrecorded, unless they belong to a group at which one is specially working. Indeed the very rarity of some cases is apt to make one argue, 'there is no use in taking a record of an isolated case, for this disease is so rare that in all probability I shall not meet with it again.' Such a view is a most mistaken one, for the rarest cases do recur if they are only looked for; if each isolated case is noted as it occurs, the diligent observer will, after some years, be astonished at the store of valuable material which has slowly and gradually accumulated. A little resolution and persevering self-sacrifice is required at the outset, but soon note-taking becomes a habit, and in my experience, greatly conduces both to thoroughness and to the interest which the practitioner takes in his work. In hospitals, more especially in those attached to large medical schools, where the physician is abundantly assisted by clinical clerks, there is, of course, no difficulty in obtaining a minute record of every case.

In recording cases, the object should be to make, as it were, a word-picture or word-diagram, to include all the facts, bringing prominently into the foreground those of most importance, and placing in the background those of lesser value; all unnecessary facts should be omitted. When any symptom or sign which is characteristic of the special disease under observation is not present, that negative fact should be noted. It is obvious that this can only be done when the observer is well acquainted with the usual type-picture.

The language in which the case is recorded should be as simple, precise, and intelligible as possible. The observer should record simply what he sees and hears; he should, in short, so far as possible note the bare facts, avoiding any words or terms which are likely to give a meaning to the symptoms and signs which they do not in reality possess. Vague terms, such as big, little, great, small, should not be used; definite quantities and measurements should, if possible, be employed, or a comparison made to some familiar object of known average dimensions. A tumour, for example, when it cannot be measured may be compared to a billiard ball, walnut, cherry, etc. In recording the statements of the patient, the observer must be careful to get at the actual facts, avoiding, in most cases, the theories of the patient, and simply describing the symptoms and sensations which are complained of. Indefinite terms, such, for example, as 'fit,' which may mean several different things, should never be allowed to pass undefined. When such terms are entered in the record, the exact significance to be attached to them should always be stated. Instead, for example, of simply stating 'the patient's friends say that her illness commenced with a fit (or, with an epileptic fit),' the recorder should state 'the patient's friends say that her illness commenced with a fit, which was obviously epileptic in character' (the reporter should insert his initials here to show that the fit was epileptic in *his* opinion); 'it was ushered in by a scream, followed by sudden loss of consciousness; during the attack the patient was much convulsed on both sides of the body foamed at the mouth, bit her tongue,' etc. All morbid sensations should, so far as possible, be referred to definite anatomical points on the surface of the body; when the terms 'right' or 'left' are used, it is a good plan to underline the word in order to show that the reporter was quite sure about the particular side which was meant. One is very apt unconsciously to write *right* for *left* and *vice versâ;* and on looking over the records of old cases I have in several instances come across errors of this kind which it is not always possible to detect, or, if suspected, to correct afterwards, and which may be of practical importance. If the reporter sees reason to doubt any of the patient's statements, or to differ from any of his theories or conclusions, a note to that effect, duly initialed, should be inserted in the margin of the record.

Methods of Case-Taking.—It is not necessary to attempt to describe in detail the many different methods of case-taking which have been recommended. Suffice it to say, that the student should *master* some good method. Any complete method, such as my own, which will be presently described, is necessarily very elaborate and long. It must not, however, be too hastily supposed that any of its details can be safely dispensed with, for it must be remembered that the more accurate and detailed the examination, the more accurate and detailed will be the data on which the diagnosis, prognosis, and treatment are based. The beginner should closely follow the complete method in all its details; for, like a traveller in an unknown country, if he attempts to leave the beaten track, he will be likely to lose his way and wander about; it is only when he is perfectly familiar with the ordinary highway that he can judiciously attempt to make short cuts.

The fulness with which the method of case-taking should be carried out in any given case, depends upon a variety of circumstances. In hospital practice, where there is abundance of assistance; in all cases of importance, and in which the record is required for scientific purposes, the complete method should be used. In private practice, when time presses, in trivial cases, and in many other circumstances, many of the details may be dispensed with. In a case of itch, for example, a minute inquiry into the family history would be altogether unnecessary; but in a doubtful case of phthisis or of insanity, and in every case of examination for life assurance, this point must be carefully investigated. When the patient is too ill to submit to a long examination; in infectious cases, such as typhus and diphtheria, where the physician should be careful not to run unnecessary risks, and not to remain in longer or closer contact with the patient than is absolutely necessary; in dispensary practice, where the patient is often so dirty that a thorough examination is out of the question; and when the patient is a medical man, the examination may with advantage be curtailed, and many of the details of the elaborate scientific method omitted.

In all cases the same general plan of examination should be adhered to. In obscure and difficult cases every detail should be carefully gone into and nothing omitted. The student is apt to shirk hard and difficult cases, but the skilled observer who takes a real pleasure in his work delights in them; nothing gives him greater pleasure than to grapple with their difficulties; it is from difficult cases that he learns most: and it is by patiently investigating and observing obscure cases that additions to our knowledge of disease are most likely to be made.

Method of Case-Taking.—With these preliminary remarks I may now describe in detail the method of case-taking which I am in the habit of using. It consists of the following headings:—

1. **PRELIMINARY PARTICULARS:**—Name—Age—Sex—Married or Single—Occupation—Full Postal Address—Date of Admission to Hospital—Ward—Bed.

2. **COMPLAINTS:**—(The symptoms which bring the patient to consult the physician.)

3. **THE HISTORY:**—

(a.) **Of the Present illness:**—The exact date of its commencement. The exact mode of its commencement. The supposed cause of the attack. The exact character of the symptoms, the order of their appearance, and the treatment which has been adopted up to the time the patient comes under observation.

(b.) **The Health History prior to the present attack:**—Especially of any illness likely to be related to the present one. The habits, mode of life, general circumstances and surroundings of the patient.

(c.) **The Family History:**—Especially the occurrence of any disease related to the affection from which the patient appears to be suffering.

4. **THE PRESENT CONDITION:**—

(a.) **The Physiognomy of the Case:**—The facial expression, attitude, gait. The general state of nutrition. The description of any striking abnormal appearances.

(b.) **The temperature or body heat:**—(It is usually convenient to insert the thermometer in the axilla at the commencement of the oral examination,—when, for instance, the history of the case is being enquired into.)

(c.) **The condition of the different systems and organs in detail.**

The digestive, circulatory, genito-urinary, and nervous integumentary systems must all be exhaustively examined in the manner which will be afterwards described.

That system is first examined which, from the complaints of the patient, the history and the physiognomy of the case, seems to be primarily or chiefly affected. When, for example, the patient complains of cough, expectoration, and emaciation, the respiratory system is first examined; when he complains of loss of power in the lower ex tremities, the nervous system, and so forth. After the system, which seems to be primarily implicated, has been thoroughly exhausted, that system is next examined which is most intimately related to it. When, for example, the circulatory system is first examined, the respiratory system is next investigated, and *vice versâ*.

5. **THE DIAGNOSIS** :—This should be fully stated, the primary disease being first specified, and the secondary and tertiary complications then enumerated.

6. **THE PROGNOSIS** :—Immediate and remote.

7. **THE TREATMENT** :—Hygienic, dietetic, medicinal (general and local).

8. **THE SUBSEQUENT COURSE OF EVENTS** :—The progress of the case while the patient is under treatment. The mode of termination. In fatal cases, the record of the *post-mortem* examination (naked-eye and microscopic).

Each of these headings must now be briefly considered, and the information which is likely to be derived from it indicated.

PRELIMINARY FACTS.

NAME.—The name of the patient, which must of course be entered in full for the purposes of future reference and identification, seldom gives any information to the hospital physician; in private practice, by associating the patient with some particular 'stock,' whose tissue peculiarities and morbid tendencies are known to the family doctor, it is sometimes useful and suggestive.

AGE.—The age of the patient is of considerable importance, for, in the *first* place, the anatomical and physiological condition and the pathological proclivities of the different tissues and organs are very different at different periods of life, more especially if we compare the great periods of development, maturity and decline. This is one of the main reasons why some diseases are more prevalent at, or are limited to particular periods of life; another being the fact, that at different periods of life the whole surroundings, habits, and mode of life of the individual are different.

The following are some examples of the diseases which are apt to prevail at different periods of life:—

Childhood.—In childhood the *exanthemata* (measles, scarlet fever, etc.) usually occur; *tubercular meningitis, tabes mesenterica, icthyosis, rickets, polio-myelitis anterior acuta, pseudo-hypertrophic paralysis,* and *chorea,* are other instances of diseases which are most frequently met with at this period of life.[1]

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[1] *The child's susceptibility to the exanthemata.*—It may be stated as a general law, that the majority of individuals are susceptible to the poison of the exanthemata from early childhood. The exact period at which the susceptibility commences seems to vary with

Puberty and early manhood.—At or about the time of puberty in women, *hysteria* and other convulsive affections are common, and *chlorosis* is of frequent occurrence. *Gonorrhœa* and *syphilis* are frequently met with during early manhood. *Ulcer of the stomach* is common in young women; *acute rheumatism* is of frequent occurrence at this period of life; *phthisis* seems to be most prevalent between the ages of 20 and 25.

Active manhood.—Aneurisms, locomotor ataxia, and the different forms of *paraplegia* may be instanced as diseases which are most frequently met with during this period of life. The numerous affections due to *alcoholic excess* are also of frequent occurrence.

With the cessation of menstruation many functional affections are frequently met with; *cancer of the breast* is very common, and *organic diseases of the uterus* are frequently observed.

Old age.—With the period of decline and old age the many different conditions which depend upon tissue decay and senile degeneration become prevalent; *cerebral hæmorrhage* with resulting *hemiplegia, fatty heart,* and *angina pectoris* may be mentioned as typical illustrations.

In the *second* place, certain diseases are much more serious at one period of life than at another. *Capillary bronchitis* is very fatal both in very young and very old people; *acute croupous pneumonia,* too, is usually fatal in old people. An *epileptic convulsion* in a child is, on the other hand, not necessarily a grave symptom, for in children it is frequently met with at the commencement of the exanthemata and other affections attended with a sudden rise of temperature, and corresponds to a rigor in the adult.

In the *third* place, in certain families there are critical periods or times of life at which certain diseases, such as phthisis and Bright's disease, tend to appear, and at which special precautionary measures are therefore necessary. Further, it not unfrequently happens that if the

different diseases (young infants, for example, do not as a rule take scarlet fever, although they do take small-pox); and since one attack is usually preventitive against a second, and since the majority of individuals are exposed to the poison during childhood (schools, evening parties, and all places in which children congregate being in many cases the centres of infection), these diseases are more common at this than at any other period of life.

The susceptibility to pseudo-hypertrophic paralysis, the hæmorrhagic diathesis, and perhaps some other diseases which are hereditary, is probably handed down from the mother to the child, the tendency to the disease being born with the individual. In cases of this description, the stronger the tendency, the earlier will the disease be in appearing in any given case, and the earlier the date of appearance the more severely, in all probability, will it be manifested.

critical period be safely past, the special precautionary measures may be relaxed, for after the critical age the tendency to the disease declines.[1]

In estimating the age of an individual, his expectancy of life, the period at which the diseases of old age are most likely to arise, and other questions of a similar nature, the absolute age in years is of much less importance than the relative age of his organs and tissues. Some men at 50 are as old as others at 70. The pregnant remark of Dr Wilks, that 'a man is as old as his arteries,' should never be lost sight of. Everyone with atheromatous vessels is an old man, however healthy and fresh he may appear. I have known several instances in which young-looking, wiry, and unusually active people, have died about the age of 70 from cerebral hæmorrhage; to look at them you would have said that they had every chance of living for many years; a diseased condition of the minute cerebral vessels is not, therefore, incompatible with activity and great apparent freshness. In estimating the probable duration of life, therefore, in any given case, the condition of the vascular system, more especially of the peripheral vessels, is a point of the greatest importance. The presence of an *arcus senilis,* diminution or loss of sexual activity in the male, the cessation of the menstrual function in women, diminished sensibility of the retina, and early presbyopia (Gairdner), are other indications that the period of activity has passed, and that decline is commencing, or has already advanced.

It must also be remembered that some patients (in hospital and dispensary practice more especially) are ignorant of their exact age. Further, the tendency which the members of the female sex in all ranks of life, sometimes have to underestimate their age, is well known to everyone.

SEX.—Some diseases are more common in men than in women, and *vice versâ.* This is partly owing to differences in organisation, constitution, and temperament, and partly to differences in occupation, habits, and mode of life. Abdominal tumours, for example, are much more common in women than in men, because of the presence of the uterus and ovaries in the former. Women are, as a rule, more nervous than men, more subject to hysteria and all forms of emotional manifestation. Diseases due to exposure (such as acute rheumatism and bronchitis); external injuries; diseases produced by strain (such as aneurisms); the many different affections which result from over-indulgence in alcoholic liquors (such, for example, as delirium tremens and cirrhosis of the liver), syphilis and gonorrhœa are much more common in the male sex. There are, too, many different affections which belong to particular trades or occupations which are met with in one sex more than in the other. The worries and anxiety of business, for example, fall chiefly on men, who are fortunately, however, more fitted both by habit and organisation to cope with mental strain of this description. In some cases, such as pseudo-hypertrophic paralysis and the hæmorrhagic diathesis diseases, which chiefly affect the male sex (but which are chiefly transmitted through the female), and exophthalmic goitre, which is chiefly met with in females, it is difficult or, in the present state of our knowledge, impossible to give any satisfactory explanation of the fact that one sex is more liable to be affected than the other.

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[1] I have met with two separate families in which there was a strong tendency to the development of chronic Bright's disease (the contracted form of kidney) about the ages of 20 and 23 respectively.

Married or Single.—This is not, as a rule, a point of great importance. Married men are for the most part steadier than single men, and less liable, therefore, to suffer from syphilis, gonorrhœa, and the baneful effects of alcoholic excess. It is needless to say that this is a very general rule. Married women run some risks during pregnancy and parturition, more especially during the first labour. Some organic uterine diseases, such as endometritis and epithelioma of the os uteri and displacements, are more common in married women: imaginary derangements in the unmarried.

In the case of women who have borne children, the number of pregnancies or miscarriages, and the condition of the children (whether healthy or otherwise) should always be specified, for the condition of the child not unfrequently throws some light upon the health history of the parent. The marks of hereditary syphilis in the child, for instance, may indicate the true nature of some obscure disorder of the father or mother.

Occupation.—The occupation of the patient is, in many cases, a point of the greatest practical importance. In the *first* place, it may be stated as a general rule, to which, however, there are numerous exceptions, that an indoor sedentary life is less healthy than an outdoor, active one. Persons living in towns and following indoor occupations are more liable, other things being equal, to suffer from dyspepsia, scrofula, phthisis, malaise, etc. But it must be remembered that persons living in the country and breathing the purest and freshest air during the day, are often badly situated in other respects; too often the ventilation of their sleeping apartments is most inadequate; in some districts they are in the habit of shutting themselves up in box-beds, with, it is needless to say, the result that all the advantages which they derive from the fresh air during the day are much more than counterbalanced by the foul air which they breathe during the night. In the country, too, the drainage and water supply are often anything but satisfactory.

In the *second* place, persons in the upper ranks of society, the professional classes, and those in easy circumstances generally, are more advantageously situated than the artisans and lower classes. The sanitary arrangements of their houses, their feeding, clothing, and whole mode of life are, as a rule, more satisfactory. There are, of course, innumerable exceptions to this general statement. One of the worst occupations of all, from a sanitary, as from every other point of view, is having nothing to do. Want of occupation is a fertile source of hysteria and other functional derangements of the nervous system in women; men are much less liable to suffer from *ennui* and its results, for most men, who have no occupation in the true sense of the term, and no special taste for literature or indoor work, busy themselves in sport and outdoor amusements, all of which are so eminently conducive to good health. Persons in easy circumstances are of course more liable than the lower classes to suffer from dyspepsia, gout, and the other conditions which result from high living.

In the *third* place—and this is much the most important point—special occupations produce or predispose to special diseases. Space does not permit me to give a complete list, but the following may serve as illustrations:—The labouring and lower classes are more liable to diseases which result from exposure, accidents, strain, and drink. Medical men, hospital nurses, and medical students run more risks of contracting contagious and infectious diseases than other people; medical men and medical students are frequently the subjects of imaginary diseases, such as imaginary diseases of the heart, lungs, etc., few of us, I presume, have not some personal experience of this kind; painters and workers in white-lead are liable to suffer from lead poisoning; woolsorters and butchers are more liable to suffer from splenic fever than other people; workers in tar, sugar, petroleum, etc., are liable to suffer from eczema; chimney-sweeps used frequently to be affected with epithelioma of the genitals, and post boys from popliteal aneurisms; lucifer match makers, who work with phosphorus, are liable to be affected with necrosis of the jaw; stone masons and knife grinders, potters, woolcarders, and all persons who inhale fine dust particles, are liable to suffer from bronchitis, cirrhosis of the lungs, and rapidly destructive forms of phthisis; coal miners are apt to be affected with anthracosis; soldiers, sailors and prostitutes are more frequently affected with syphilis than the general average of the population; soldiers, paviors, puddlers, and the labouring classes generally, are more frequently affected with aneurism of the aorta, for in them the two great causes of aneurism, viz., arterial degeneration and strain are most frequently met with in combination; soldiers, sailors, and travellers in foreign countries are the persons in whom intermittent fever, dysentery, scurvy, and tropical abscess of the liver most commonly occur; brewers, draymen, publicans, wine merchants, more frequently suffer from delirium tremens, cirrhosis of the liver, chronic dyspepsia, kidney disease, and other affections which result from alcoholic excess.

RESIDENCE.—The full postal address must be carefully noted, in order that the patient may, if necessary, be communicated with after his discharge; notwithstanding every precaution, it sometimes happens, more especially in hospital practice, that the patient cannot be traced, and that the physician is consequently left in ignorance as to the subsequent course of events.

It occasionally happens that the place or country in which the patient has resided, gives a clew to the nature of the affection from which he is suffering, as for example in the case of ague, dysentery, abscess and hydatid disease of the liver. Again, when an epidemic disease is prevalent in a country or district, the fact that the patient has been residing in the affected locality may be of great importance. When, for instance, a patient who has just come from a district in which small-pox is known to be epidemic, complains of headache, pain in the back, general malaise, feverishness, the symptoms have much more significance than they would have if he had been living in a locality altogether free from that disease. Again, the manner in which cases of typhoid are distributed in a town or district may give most important information as to the source of infection, showing, for example, that the poison has been carried by a particular water supply, or distributed to the customers of a certain dairy. Further, the fact that certain localities are known to be much more healthy than others, may have some general bearing on the case. Again, the persons living in a certain locality or district may follow some particular trade, or may have some peculiar habits or mode of life which render them liable to special complaints. The late Dr Charlton of Newcastle, in describing the habits of the people in a small town in the north of England, once told me that he never asked whether a patient in that town drank, for drinking habits were almost universal, he simply asked *how much* the patient drank.

Complaints.—The complaints or the symptoms which bring the patient to consult the physician are, as has been previously remarked, of the greatest importance; in many cases they show the system or organ which is affected, and in all cases they guide the course of the subsequent examination.

In some cases, the complaints of the patient are purely *subjective;* such symptoms, for example, as pain, numbness, a feeling of heaviness; in others they are objective (*i.e.* perceptible to the physician), such as dropsy, shortness of breath; in others again, they are both subjective and objective.

So far as possible the patient should be allowed to tell his own tale, and to describe his complaints in his own words, the object of the physician being, it must be remembered, to get his actual morbid sensations, and not his theories as to the nature or mode of production of the illness.

In those cases, such for instance as some cases of insanity, in which the patient is unable to describe or specify his complaints, the difficulties of diagnosis are, as has been previously stated, very much increased.

These preliminary particulars, the description of which has occupied a considerable space, are very soon elicited in actual practice.

THE PREVIOUS HISTORY OF THE CASE.

Under this head are included, as has been already pointed out: (a) the previous history of the present attack; (b) the previous health history prior to the present illness; and (c) the family history: each of which must be considered in detail.

The previous history of the present illness.—In the *first* place, *the exact date at which the present illness commenced* should, if possible, be ascertained. In some cases, as for instance in those affections which commence with such a definite symptom as a rigor, the point is easily determined; in others, the departure from health is so slow and gradual that the patient is unable to fix the exact date at which his illness commenced; in cases of this description he may be able to say when he last felt *quite* well, or, at all events, when the symptoms became sufficiently severe to necessitate his leaving work.

By determining the exact date at which the attack commenced, we are able to decide whether the illness is acute or chronic—a point which is, in some cases, of considerable practical importance, as will be seen from the following brief summary of the leading features of acute diseases.

The chief characters of acute diseases.—The onset is, as a rule, sudden, the course rapid (the duration, excluding the period of convalescence, does not, as a rule, exceed three weeks), and the termination is usually either in complete recovery or death; acute croupous pneumonia and the specific fevers are good examples. The majority of acute diseases are attended with pyrexia; but this is not an essential characteristic for a sudden attack of diarrhœa or of collapse with the faintness and sickness which attend a severe blow upon the testicle, may quite appropriately be termed acute.

In attempting to determine whether a disease is acute or chronic, it is essential to remember that many conditions, which at first sight appear to be acute, are in reality acute or subacute exacerbations of complications superadded to some previous diseased state; peritonitis, the result of perforation of the stomach in a case of chronic gastric ulcer, and an intercurrent attack of acute nephritis in the course of chronic Bright's disease, are excellent illustrations. In some cases, the symptoms of the previous illness are ill-defined, and can only be elicited by the most careful investigation; they are altogether overshadowed, as it were, by those of the acute attack, which may easily be diagnosed as the primary condition. Such mistakes in diagnosis not unfrequently lead to erroneous opinions as to the future course of the case; acute Bright's disease, for instance, in a previously healthy person is, in most instances, recovered from, but the prognosis of chronic Bright's disease is very unfavourable.

The exact date at which the illness commenced is sometimes, when taken in conjunction with the symptoms, of diagnostic value. In a case of fever, for example, if the temperature during the first week does not exceed 103° F., the disease is almost certainly not typhus; again, if the temperature does exceed 105° F. during the first few days of a fever, the disease is probably not typhoid. Conclusions of this sort are only, of course, possible when the exact date at which the illness commenced can *with certainty* be determined, and when there are no complicating conditions capable of producing elevation of temperature present. The removal of the patient from his own home to hospital is a disturbing element of this description, with which all experienced hospital physicians are acquainted.

In the *second* place, *the exact mode of commencement of the attack, the character of the symptoms*, and *the order in which they are developed* must be determined. The importance of accurately noting these points will be seen from the following illustrations:—Acute croupous pneumonia is much more frequently preceded by a rigor, than acute pleurisy. A slowly developed and gradually progressive hemiplegia is almost invariably due to a lesion of the cerebral cortex or the pressure of a new growth upon the motor (pyramidal) tract, and not to cerebral hæmorrhage, embolism, or thrombosis—the usual causes of hemiplegia. A sudden attack of hemiplegia, which is not attended with loss of consciousness, is more probably due either to embolism or thrombosis, than to cerebral hæmorrhage.[1] In a case of unilateral convulsions it is important to observe the muscle or muscles which are first convulsed, for it may enable us to determine—a point both of practical and scientific importance—the exact localisation of the cortical lesion. Again, in a case of paralysis with extreme muscular atrophy, it is important to determine whether the paralysis appeared suddenly at the commencement of the attack and was quickly followed by marked atrophy, as it would be in *polio-myelitis anterior acuta* or injury of the motor nerve, or whether the muscular atrophy preceded the paralysis, the motor weakness increasing *pari passu* with the muscular wasting, as would be the case in *progressive atrophy.*

The importance of not accepting such indefinite terms as 'fit,' but of defining the exact nature of the attack—the symptoms and the sensations which the patient experienced—has already been insisted upon.

The treatment which has been adopted up to the time when the patient comes under observation should also be ascertained, the name of the medical man by whom the treatment was recommended being entered in the notes. In those cases in which the physician has the advantage of a written statement from the medical man who was previously in attendance, such statement should be pasted in the case book.

The original symptoms may be materially modified by the previous treatment. Digitalis, for example, when given in full doses may completely change the character of the cardiac action and of the pulse; the knowledge, therefore, that the patient has been taking digitalis may be of great practical importance. Again, the character of a skin eruption may be entirely modified by external applications. In other cases, again, in which there is no skin disease, eruptions may have resulted from internal remedies or external applications; the eruptions produced by the internal administration of iodide of potassium, and the external application of croton oil, for example.

In other cases, the treatment which has been adopted serves as a clew to the nature of the case; when, for instance, the patient has been taking iodide of potassium and mercury, we at once suspect syphilis.

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[1] There are, however, numerous exceptions to this general rule. It must not be inferred that a hemiplegia which was at its commencement attended with unconsciousness is necessarily due to cerebral hæmorrhage, for in some cases of embolism there is coma.

In all cases it is important to ascertain if there is any distinct cause for the attack. In a case of fever, for example, where there is no localised inflammation or other obvious cause, the physician should inquire whether the patient has been exposed to any source of infection, whether there is any epidemic in the neighbourhood in which he lives, etc. In non-infectious cases, both the predisposing and exciting causes of the attack should, if possible, be determined. With this end it is often necessary to put leading questions, for the patient may be quite ignorant of the bearing which previous illnesses or accidents have on the present attack; in a case of acute Bright's disease, the patient must be asked if he recently suffered from scarlet fever; in a case of valvular lesion of the heart, whether he has ever suffered from acute rheumatism; in a case of intra-cranial tumour, whether he has had syphilis, and so forth.

When external violence is supposed to be the cause, the degree and kind of violence and its direction, the exact point of the body which was injured, the exact character of the symptoms and appearances which followed the injury, and of the subsequent local and constitutional symptoms, must all be most carefully investigated. In some cases, it is only by attention to these details that it is possible to determine, whether the alleged injury was adequate and likely to produce the symptoms from which the patient is suffering at the time of the examination. In railway compensation cases, these points must always be minutely investigated. In the following case the tardy appearance of the discolouration, its great extent and long continuance, showed that the extravasation was very extensive and deep-seated (beneath the muscles of the calf); and hence that the injury must have been a very severe one, for such an extravasation could only be produced in a perfectly healthy individual by great violence. The case was as follows:—A lady was seated in a second class railway carriage when a collision occurred. She was first thrown forwards, then backwards, and in falling backwards the calf of the left leg came in violent contact with the edge of the seat on which she had been sitting. Great pain and tenderness on pressure were complained of, and there was some swelling of the calf; but for several days no other local indications of a bruise were seen. At the end of ten days discolouration began to appear. Ultimately the whole leg from the knee to the ankle was deeply ecchymosed; the discolouration lasted several weeks. In addition to the injury to the leg, there was much pain and stiffness in the hip and back, and marked symptoms of general nervous shock:

but to these symptoms, and the many other points of interest connected with the case, I need not now refer.

The health history prior to the present illness.—(Some authorities recommend that this part of the inquiry should be deferred until the 'present state' of the patient has been investigated. I prefer to take it here, adding any particulars which may be subsequently elicited.) In inquiring into the previous health of the patient, the physician should, in the first place, get a general statement whether the patient's health has been good or bad, and should next endeavour to elicit a history of those illnesses which are likely to have had a direct bearing on his present state of health; or, which show the pathological leanings or failings of his constitution. Tact, discrimination and knowledge, are, as I have previously explained, essential in order to ascertain these points with rapidity and accuracy, and to elicit all that is of importance and pass by all that is unnecessary. It is in many cases necessary to ask leading questions; in a case of supposed abscess of the liver, for example, the patient must be questioned with regard to a history of dysentery; in a case of enlarged spleen, with regard to a history of ague, etc. It is often of great importance to determine whether the patient has suffered from syphilis. Men should be questioned directly on the point: when the physician feels confident, from the symptoms and appearances, that there is a syphilitic history, it is better to ask the patient *when* he had the disease, rather than *if* he has had any venereal affection; many persons who are truthful in other respects do not hesitate to deny syphilis. When the question is put in the way I have indicated, they see that the doctor understands all about the matter, and at once confess. It is only, however, when the physician feels quite confident in his opinion that the question should be put in this manner, for if the patient has not had the disease, he is apt to be indignant, and the practitioner to find that he has made an awkward mistake. When it is evident that the patient is keeping back something, it is sometimes a good plan to leave that subject for a time, and to return to it when his confidence in the practitioner is perhaps greater. When a history of a venereal sore has been obtained, it must not be too hastily concluded that it was syphilitic; when there were secondary symptoms there is of course no room for doubt.

In women it is often difficult or impossible to get a direct history of syphilis; it is a delicate thing to question a virtuous woman on this point. In women a chancre is more apt to pass unnoticed than in men; and many women, even if they know that there has been a local sore, are quite ignorant of its true significance. Under such circumstances the physician has to rely upon indirect and collateral evidence; to question the patient as to sore throat, skin eruptions, loss of hair, iritis, and other secondary or tertiary manifestations; to ask if she has had any miscarriages or dead-born children; to inquire into the health of the children, whether they suffered from 'snuffles,' if they had any skin eruptions soon after birth, and if so, their exact character and the parts of the body which were affected; to see if their (permanent) teeth are syphilitic, if there are any fine scars at the angle of the mouth, opacities of the cornea, etc.

The habits, mode of life, general circumstances and surroundings of the patient, must next be investigated. The kind of life he leads, his hours of getting up, eating, and going to bed; the amount and kind of exercise he takes; the amount and kind of food he eats; his habits as regards alcoholic liquors and tobacco; the amount and sort of recreation and holiday he takes; the presence or absence of business and domestic worries; and many other points, the special importance of which will be more particularly insisted upon when the examination of the digestive, circulatory, nervous, and other systems, is described in detail.

The Family History.—A careful inquiry into the family history is, in many cases, of the greatest importance, for the pathological peculiarities are handed down from parent to child, just as anatomical and physiological ones. Phthisis, gout, scrofula, various nerve diseases (such as epilepsy, insanity, progressive muscular atrophy), rheumatism and cancer may be mentioned as illustrations. A knowledge, therefore, of the hereditary morbid tendencies and tissue peculiarities of the patient is of the greatest practical importance, both for the prevention of disease and for its proper management and treatment when actually present. It is here more especially that the family medical attendant has such an advantage over the consultant.

Life assurance companies very rightly demand a careful inquiry into the family history, for the hereditary tendencies of the patient and the nature of the diseases with which his near relatives have been affected, are important both in a positive and a negative sense. The medical referee should indeed remember, that the interest of the applicant for insurance, as well as of the insurance office, should be attended to. When, for instance, a near relative has died of acute pulmonary disease, it is for the best interests, both of the proposer and of the company, that the physician should endeavour to determine with certainty whether the attack was one of acute croupous pneumonia or of acute phthisis.

In investigating the 'family history' the physician should, in the *first* place, endeavour to obtain a general statement whether the patient's relatives (both on the side of the father and of the mother) are long or short lived, healthy or delicate; and in the *second*, a specific statement as to the special forms of disease with which they are liable to be affected. This information may sometimes be made more striking and diagrammatic if it is arranged in a tabular form (see foot note[1]), or in accordance with the plan recommended by my friend Dr Leslie of Falkirk.[2] In hospital practice it is often difficult or impossible to get detailed information of this description, for even well-educated persons may be unacquainted with the necessary particulars. The tendency that there is to keep secret some hereditary diseases (such, for instance, as insanity, cancer, epilepsy), must not be forgotten. It must also be remembered that it is not always the same disease which is handed down from parent to child. This statement applies more especially to affections of the nervous system; a parent may be simply 'nervous,' 'hysterical,' or unstable: the children may be epileptic; the grandchildren insane; or, instead of the pathological condition increasing with succeeding generations, it may gradually diminish and ultimately disappear. The child, it must ever be remembered, represents both parents; the bad or pathological qualities of one are doubtless often corrected or counterbalanced by the good (physiological or normal) of the other. When both parents have the same pathological tendencies, as is likely to be the case when near relatives (*e.g.* first cousins) intermarry, the child will probably manifest the morbid peculiarities and tendencies in a much stronger degree than either of them; it must not, however, be forgotten that the good qualities tend to be strengthened in the same way as the bad. It is important that these facts should be known to parents, and that they should endeavour to impress them upon their

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[1] *Tabular Statement for recording the Family History.*

	Age, if Living.	Healthy or otherwise.	Special diseases to which liable.	Age at Death.	Of what disease.
Father ...					
Mother ..					
	Number and age, if Living	Healthy or otherwise.	Special diseases to which liable.	Number and Age, if Dead	Of what disease.
Brothers					
Sisters ...					
Children					

Note. In many cases it is necessary to make a more minute inquiry, and to ascertain the health history of the patient's grandparents, uncles and aunts, cousins, etc.

[2] See *Transactions of Ed. Med. Chir. Society*, 1881-82, p. 119.

children, for undoubtedly some marriages, which are exceedingly injudicious from a health point of view, would thereby be prevented.

In some cases hereditary disease chiefly affects the males of a family, but is transmitted for the most part through the females (see fig. 3); gout, the hæmorrhagic diathesis, and pseudo-hypertrophic paralysis are excellent illustrations. The term *atavism* (from the Latin *atavus*, a forefather) is given to the condition in which there is the re-appearance in an individual of some anatomical, physiological, or pathological condition which was present in an ancestor, not the immediate parent.

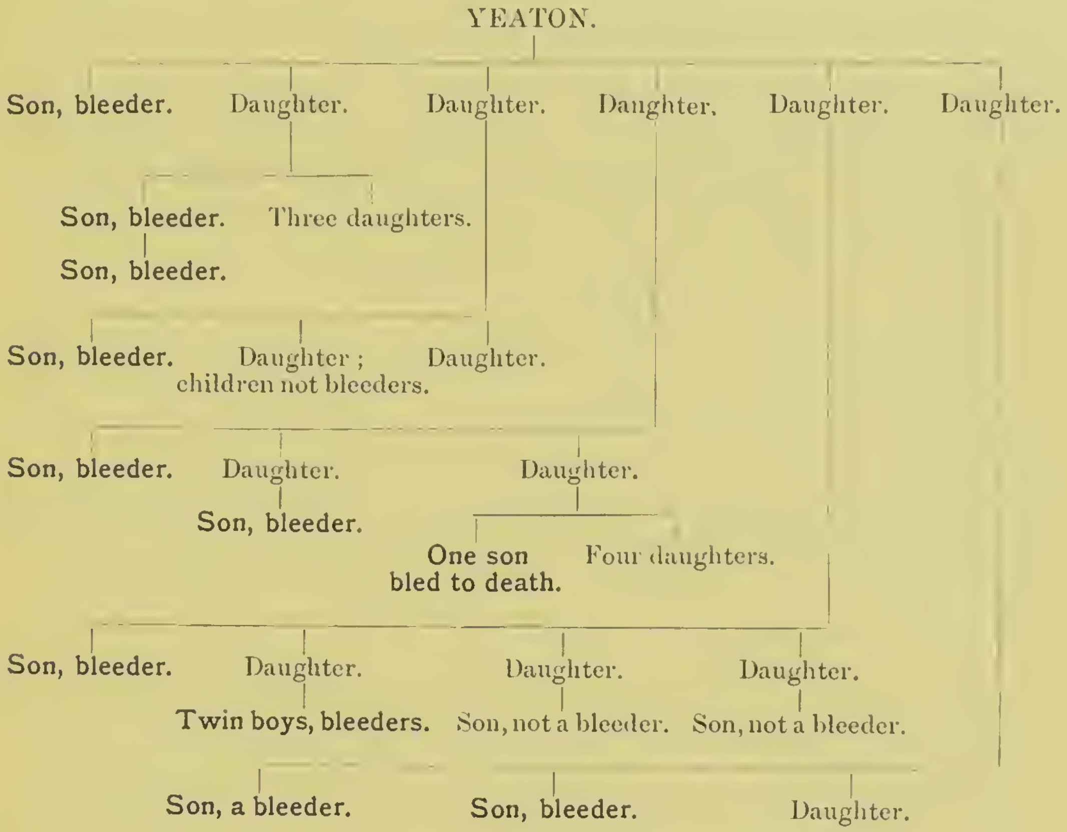

FIG. 3.—*Chart showing the hereditary transmission of Hæmophilia in the Yeaton family.* (*After Gould.*)[1]

In many cases it is not, of course, the actual disease which is transmitted from parent to child, but a tendency to be affected by some exciting cause or morbid stimulus which is incapable of acting upon the ordinary run of persons. It is probable, for example, that phthisis is only hereditary in this sense, that a peculiar weakness or vulnerability of lung tissue is transmitted, that this predisposes the individual to attacks of pulmonary catarrh, and that a suitable local condition or nidus, in which the tubercle bacillus (which those of us who live in towns are probably inhaling every day) can live and develop, is thereby established. Possibly, however, the tubercle bacillus may itself be able to irritate and produce disease in the lungs of persons possessing the hereditary tendency (irrespective of the occurrence of any catarrhal nidus, such as the former view supposes necessary), whereas it is quite innocuous to the great majority of persons. The former view is, in my opinion, the most probable, and it is of the greatest practical importance, for it shows that even where the hereditary tendency to phthisis is strongly-developed, a very great deal can be done in the way of guarding against and preventing the actual onset of the disease. I should perhaps add, that bad feeding, mental anxiety, everything in short which depresses the general tone and vital powers, probably act as contributory predisposing causes, and render the pulmonary tissues (if we adopt the first theory) more susceptible to attacks of localised catarrh, or (if we adopt the second) to the irritating influence of the bacillus.

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[1] Copied from Pepper's *System of Medicine*, vol iii. p. 933.

THE PRESENT CONDITION.

The investigation into the present condition or actual state of the patient when he comes under the notice of the physician, is by far the most important part of the examination. In hospital practice, more especially in acute cases in which the symptoms and physical signs develop quickly and undergo rapid modifications, the examination should be made as soon after admission as possible, the date at which it is made being entered in the notes. In private practice the present condition is of course fully investigated at the first visit.

The Physiognomy of the case.—(By the term physiognomy of the case, I mean not only the facial appearance or physiognomy commonly so termed, but the *tout ensemble* of the case, including the facial appearance, state of nutrition, condition of the breathing, posture, gait, etc.; in short everything which the physician observes in connection with the patient, exclusive of the facts which are observed by the physical examination of the different organs and systems, which will be afterwards described).

While the preliminary facts and previous history are being elicited, the physician is both consciously and unconsciously forming an opinion as to the nature of the case; excluding this or that condition, narrowing the inquiry, limiting the disease to this or that system or organ; and in some cases coming to a positive conclusion as to the exact nature of the morbid process. His conclusions are based upon the impression which the whole appearance, conduct and bearing of the patient,—in other words, the physiognomy of the case—make upon his mind, and this impression necessarily guides the oral examination and suggests questions both as to the previous history and the present complaints.

The value of an opinion based upon the physiognomy of the case—in other words, of a physiognomic or off-hand diagnosis—varies with the nature of the disease and the practical experience of the practitioner. In some cases it is possible at a glance to *name* the disease, but this, although the most important, is, after all, only the first step towards a complete diagnosis. It is only, too, in a comparatively small number of cases that disease produces such distinct external manifestations that it can *with certainty* be recognised; first impressions and hasty conclusions, though they sometimes lead to very brilliant results and dazzle students, are apt to be erroneous. A sharp man of wide experience has no difficulty, in many cases, in drawing conclusions with so much rapidity and precision, that his knowledge seems intuitive, and his conclusions almost miraculous to the inexperienced. The temptation to be brilliant in this way is a strong one—for after all there is no genius required—but it should not be encouraged; men who are in the habit of diagnosing cases off-hand, every now and again make huge mistakes; really good diagnosticians who aim at coming to the best possible conclusion in every case, and at acquiring the reputation of giving thoroughly sound and reliable, rather than quick and uncertain opinions, are careful, while giving due weight to the physiognomic appearances, not to be led away by them, but to suspend their judgment and to defer coming to a conclusion until they have made themselves acquainted with all the facts of the case. In short, the physiognomic appearances, although most valuable and suggestive, should, in most cases, be taken rather as a guide to the course and plan of the examination (both oral and physical), and as suggestors of special lines of investigation, than as the chief data on which the diagnosis is to be founded. It must not, however, be forgotten that 'the experience of years and the critical appreciation of the human form under a great variety of conditions, normal and abnormal, gives to the physician, in many cases, a power akin to that of the artist, incommunicable by words; an instinct of divination, so to speak, by which the true character and the history of the organism may be read in the external features and physical characteristics; and this not only as to health and disease, but as to all the leading elements of character' (Gairdner).[1]

With these preliminary remarks, I may now describe a little more in detail the information which is to be legitimately derived from the physiognomy of the case.

Firstly, the experienced and intelligent observer is able, in most cases, to form an opinion as to whether the patient is seriously ill or not, for most grave affections, when sufficiently far advanced, are attended with marked external alterations. There are, however, notable exceptions to this general statement; in many cases of aneurism of the thoracic aorta, for instance, the patient presents all the appearances of good, it may even be of robust health, and yet his life may literally hang upon a thread, for at any moment the aneurismal sac may burst.

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[1] Clinical Manual for the study of medical cases, by James Finlayson, M.D., p. 8.

Secondly, in a large proportion of cases, the physiognomic appearances enable the physician to determine the particular system or organ which is chiefly affected, or at all events, to say that the condition is in all probability due to one or other of a certain group of diseases. When, for example, the patient is markedly emaciated, the physician at once thinks of *(a)* those conditions which interfere with the introduction into the body of a sufficient amount of nourishment, such as poverty, obstruction in the gullet, cancer of the stomach, obstinate vomiting, etc.; *(b)* those conditions attended with profuse waste, such as fevers, phthisis, diabetes mellitus; *(c)* certain forms of malignant disease which we know by experience are accompanied by marked emaciation, such as lympho-sarcomatous enlargement of the lymphatic glands, etc. Again, when there is great dyspnœa, and the patient is cyanotic, enlargement of the right side of the heart, with primary cardiac or lung disease, is at once suggested. When the patient is markedly anæmic, the physician at once asks if there has been any loss of blood or drain from the system (such as prolonged suppuration, albuminuria, etc.), and proceeds to examine the microscopical characters of the blood, the condition of the spleen, lymphatic glands, stomach, intestine, kidneys, etc., until he arrives at the cause of the anæmia; or, if he is unable to discover any cause, and the case is not one of ordinary chlorosis, he concludes that the anæmia is idiopathic. When there is deep jaundice, he at once thinks of the liver, duodenum, and pancreas as likely seats of the disease, and directs his examination accordingly. In cases of dropsy, the condition of the heart, the kidneys, and the blood are specially investigated. When there is coma or a convulsion, the condition of the nervous system, more particularly of the brain, is first examined. In cases of delirium, the presence of a fever, such as typhus, of alcoholic intoxication, of delirium tremens, or of inflammation of the meninges of the brain is suspected.[1]

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[1] No attempt has been made to enumerate *all* the causes of emaciation, cyanosis, anæmia, and the other symptoms given as illustrations. Each of these symptoms will be afterwards more fully considered; emaciation under the derangements of the digestive organs; cyanosis under the diseases of the circulation; anæmia in connection with diseases of the spleen, etc.

Thirdly, in some cases the physiognomic appearances enable the physician to name the disease with certainty; chorea, mumps, exophthalmic goitre, pseudo-hypertrophic paralysis, rickets, and many skin diseases, such as lupus, acne rosacea, and rupia, may be given as illustrations.

Fourthly, in many cases in which there are no distinct external evidences of the disease actually present, there are appearances (for instance the scars of scrofulous abscesses in the neck, the sunken nose or mis-shaped teeth of congenital syphilis) which are indicative of former diseases, and which show the constitutional and pathological tendencies of the patient. These indications are often of the greatest practical value, for, as I have previously insisted upon, it is essential to observe the differences in constitution and organisation which different individuals present, to regard, in fact, each patient not merely as a case of this or that disease, but as an individual possessing distinct tissue peculiarities on which the special disease for which he comes under observation is, as it were, grafted, and by which the characters and course of that disease are, in many cases, most materially modified.

It will perhaps be well to define here certain terms (temperament, diathesis, etc.) which have been used to express some of these constitutional differences and peculiarities.

Temperament.—The older physicians used to attach great importance to differences of temperament, and were in the habit of arranging or classifying different individuals in four groups, viz.: the *sanguine, nervous, bilious,* and *lymphatic temperaments,* as they were termed, each of which was supposed to have distinctive external characteristics, and the members of which were supposed to be liable to different forms of disease. My esteemed teacher, the late Professor Laycock, attached the greatest importance to these external characteristics: 'He recognised six divisions—first, persons nervously active from predominant innervation; secondly, those with predominant sanguification and activity of the vascular and muscular systems; thirdly, those in whom both innervation and muscular activity are predominant, and this existing with also predominant carbon deposit or excretion—*the fibrous* or *bilious temperament;* fourthly, when the muscular system is well developed, but neither sanguification nor innervation predominant, and there is a decided tendency to the deposit of fat—*the phlegmatic temperament;* fifthly, those who are defective as regards innervation, sanguification, and muscular and vascular activity—*the lymphatic temperament;* and, sixthly, those in whom, with defective innervation, sanguification, and vascular activity, there is a combined tendency to carbon deposit—*the* *melancholic temperament.*'[1] Mr Hutchinson defines 'the term temperament as applicable to the sum of the physical peculiarities of an individual, exclusive of all definite tendencies to disease.' 'Different temperaments,' he says, 'are to be assumed to give some degree of peculiarity to morbid processes, when such have been induced by other causes, but they do not in themselves involve any special proclivity. When most strongly marked, temperament is still consistent with the enjoyment of perfect health.'[2] Mr Hutchinson doubts whether, in a large majority of cases, there do really exist in persons as yet in perfect health, any peculiarities by which we can predicate or discriminate the 'fundamental mode of vital activity;' in other words, the *temperament,* as Laycock defined it, of the individual. 'Whosoever,' he says, 'will set himself the task of attempting to classify a given number of individuals according to their temperaments will, I think, soon find himself baffled. He will discover that he is mistaking for criteria of temperament conditions which are simply indicative of youth or age, of health or disease, or the effects of past anxiety or trouble, or of comparative immunity from them. Just as the physiognomist ought carefully to exclude from his estimate of the original and inborn character of a man those traits of expression which have come to him through the wear and tear of life, and keep closely to the original features, so should the student of temperament scrupulously reject all that has been superadded, and which is in a sense accidental. Temperament, as I have endeavoured to define it, concerns the original inherited organisation of the individual, and does not include anything which is the result of the influences to which his life has exposed him. That which has accrued to him during life goes to produce or aggravate diathesis, but can do nothing in modification of temperament,[3] . . . He will find, moreover, unless I am much mistaken, that if he attempts to go beyond mere complexion, there are not more than two or three in the dozen whom he can with any degree of confidence assign to special temperaments. As to complexion itself, the further he goes the more he will have to confess that, putting various conditions of sanguification aside as being in many persons dependent upon varying states of health, he can after all classify the complexions themselves only in reference to pigmentation. The varying degrees of dark, fair, or red constitute almost the sole individual peculiarities of the complexion which are not altered by disease or diet.'[4]

But while Mr Hutchinson doubts our ability to distinguish the temperament or original vital endowment of the individual, he by no means doubts its existence, as the following quotation shows:—'I have said so much in disparagement as well of the general as of the special signs which have been held to indicate temperament, that I fear it may be suspected that I almost doubt the reality of temperament in itself. If I had given that impression let me hasten at once to remove it. There can be no question whatever as to the reality of the difference between individuals, nor any doubt as to the importance of the recognition of those differences by the medical practitioner. By far the commonest error of the prescriber, and one which most interferes with his success, is the easy-going habit of regarding all persons as alike, and recognising differences only in their diseases; or, to put it in other language, of ignoring the predisposing causes, and taking account only of immediate ones. The farmer who would succeed in his pursuits must not content himself with making sure that he has sown good seed, and according to the most approved methods. He must go further back to take knowledge of the nature of the soil with which he has to deal, of the crops which it has previously borne, and of the manures which have been used. It is much the same with us in the diagnosis and treatment of disease. In addition to the primary or exciting cause, which is of paramount importance, we have various others which may perhaps be conveniently classed together under the term *contributory*, since they contribute to control and modify final results. Amongst these, temperament—the original vital endowment of the individual—is unquestionably a real force, and one which we would most gladly recognise and estimate if we could. The scepticism which I have been expressing applies not to the reality of the thing, but to our ability to discriminate it.'[1]

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[1] I quote from Mr Jonathan Hutchinson, whose masterly lectures on The Pedigree of Disease, I would strongly advise all my readers to peruse for themselves.

[2] *Loc. cit.* p. 3.

[3] *Loc. cit.* p. 5.

[4] *Loc. cit.* p. 7.

Diathesis.—The term diathesis is defined by Mr Hutchinson to be 'any bodily condition however induced, in virtue of which the individual is, through a long period, or usually through the whole life, prone to suffer from some peculiar type of disease. Some diatheses,' he says, 'are inherited, others acquired—of some the effects are permanent and constant; of others, they are transitory or recurrent after intervals of health. The term should, however, never be applied to any condition of health which is expected to pass away and leave no trace, for the idea of persistency in some sense, is always implied.'[2] The term diathesis, then, implies a proclivity or tendency to disease, not actual present disease, it may, therefore, be applied to a person who is perfectly well.

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[1] *Loc. cit.* p. 21.

[2] *Loc. cit.* p. 3.

The distinction between temperament and diathesis.—According to Mr Hutchinson, we may say that 'the former (temperament) is a matter of physiology, and the latter (diathesis) of disease, and that the former term is applicable only to peculiarities which are a part of the original organisation of the individual, whilst the latter may be acquired as well as inherited. Thus inherited diathesis is more often than not entirely latent at the time of birth and is susceptible of aggravation, or in some cases of cure in after-life. Such alterations are not possible in the constitutional peculiarities which we name as temperament.'[1]

Dyscrasia, Cachexia.—These terms do not merely imply a proclivity or tendency to disease, but they denote that a condition of disease is actually present.

Idiosyncracy.—The term idiosyncracy may be applied to any extraordinary peculiarity of constitution which is not present in the great majority of healthy persons. A knowledge of the special peculiarities and susceptibilities of this description is often of great value. The following are illustrations of idiosyncracies: To some persons mutton, strawberries, or other articles of diet, which the great majority of persons enjoy, act as poisons, producing violent vomiting or diarrhœa. Opium, which usually produces constipation, in some persons, even when given in minute doses, produces diarrhœa. Iodide of potassium, even in small doses, in some persons produces severe skin eruptions, or even fatal effects. Some persons are altogether insusceptible to the poison of the specific fevers; others, on the contrary, are unduly susceptible, and take the same fever over and over again, whenever, in fact, they are exposed to it. These peculiarities of constitution, to which the term idiosyncracy is applied, are congenital, and often hereditary; they are usually revealed quite accidentally, and do not necessarily show any proclivity to disease, being in this respect, therefore, quite different from the diatheses. They usually consist of some temporary, functional derangement, the basis of which is, in all probability, some minute structural change too delicate to be recognised. But in addition to these functional idiosyncracies, as we may term them, Mr Hutchinson argues with great force, and brings forward cases to show that congenital structural peculiarity may entail liability to local disease, and that such disease may be locally aggressive, at any rate for a certain time, perhaps indefinitely.[2] Peculiarities of this description he proposes to term structural idiosyncracies. He states 'that whenever we find a strictly local malady which develops itself in all instances with little or no apparent cause, is hereditary, is but little aggressive, and only in a sort of accidental way influences the health of its subject, we are entitled to suspect structural idiosyncracy. Steatomata on the scalp, lipomata, adenomatous tumours in the breast, multiple uterine fibroids, milium, whether on the face or elsewhere, and a host of others, are probably examples of what I have tried to describe.'[1]

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[1] *Loc. cit.* p. 4.

[2] *Loc. cit.* p. 33.

Fifthly.—By observing the language and whole conduct and bearing of the patient, the physician is, in many cases, able to form a tolerably accurate conclusion as to the value which should be attached to his symptoms and complaints; whether he is giving a plain, straightforward statement, or whether he is shamming, exaggerating, etc.

There has been no attempt in the sketch, given above, to describe the physiognomic appearances of individual diseases in detail; such a description would be out of place here, but before leaving the subject it may perhaps be well to detail the points to which the attention of the observer is (consciously and unconsciously) directed when the patient first comes under observation; in other words, to direct attention to the factors which, in different instances, go to form the physiognomy of the case. The more important points are as follows:—

The state of nutrition, as determined by the general appearance, amount of fat, muscularity, body weight in proportion to height, etc. It is self-evident that satisfactory conclusions on this, and indeed on many other points which will be presently mentioned, can only be arrived at when the normal state of the patient as regards the special point under investigation—in this instance the state of nutrition, weight, etc.—is known.

The general physique and anatomical conformation of the patient, as determined by the build of the skeleton, the conformation of the thorax and other parts, the complexion, colour and character of the hair, the amount of fat, muscle, etc.

The strength of the patient, as shown by the facial expression, general manner, movements, gait, voice, etc.

The circumstances in which the patient is placed, whether up and going about or lying in bed; in the latter case the presumption is that the patient is really ill, or thinks himself so. Too much importance must not, however, be attached to this point.

The decubitus.—*(a) Dorsal,* for example, in great general weakness and depression, as in the terminal stages of typhoid fever; *(b) lateral,* as in many unilateral lung affections, such as pleurisy with effusion;

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[1] *Loc. cit.* p. 34.

(c) in the position of *orthopnœa*, as in many severe cardiac and pulmonary affections, such as advanced mitral disease, congestion or œdema of the lungs, severe bronchitis, more especially of the smaller tubes, copious pleuritic effusion, more especially when it is acute and bilateral, etc.; *(d) special positions*, as in the spasms of tetanus or strychnia poisoning, psoas abscess, peritonitis, etc.

The proportion between the different parts of the body; the presence of dropsical or other swellings, etc.—'There is,' says Gairdner, 'an ideal relation of size and form as between every separate part of the human body; and every outward and inward structure contributes an exactly-balanced proportion to the whole visible result. The study of this proportion, as affected by disease, and as modified by action and suffering, constitutes the physiognomy of disease.'[1] The presence of dropsy of the feet, for example, is suggestive of cardiac disease; dropsy of the face of renal disease; glandular enlargements of the neck of scrofula, etc.

The expression of the countenance as indicative of anxiety, grief, pain, the profound depression of melancholia, the excitement of acute mania, the stupidity of the idiot and imbecile; the pinched features of collapse, rigor, etc.

The colour of the skin and conjunctivæ, the condition of the circulation in the superficial vessels.—The hue of the lips, nose, ears, and finger-tips; the condition of the external jugular veins in the neck, and of the carotid and temporal arteries, are specially important.

Anæmia, cyanosis, jaundice, the bluish-grey staining of the skin (without any appearance of collapse), produced by the prolonged use of nitrate of silver; the leaden hue, with pinched features and other signs of profound collapse in cholera; the bronzing of Addison's disease; the hectic flush on the cheeks in phthisis; the pinkish flush over the malar bones, with the ivory-like swelling of the face in myxœdema, may be mentioned in illustration.

The presence of a skin eruption, such as the eruption of acne, herpes, measles, small-pox, etc.

The condition of the breathing and the presence of symptoms indicative of derangement or disease of the respiratory organs, such as dyspnœa, stridor, cough, alterations in the character of the voice, etc.

The mental condition, as shown by the facial expression, manner and bearing of the patient, his conversation, mode of answering questions, his articulation, dress, etc.

The condition of the motor and co-ordinating nerve apparatus.—*Paralysis*, for instance, may be indicated by the immobility of some part

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[1] *Clinical Manual for the Study of Medical Cases.* By James Finlayson, M.D. P. 10.

(such as the arm and hand), or the presence of some deformity (such as the twisting of the features in Bell's paralysis, drooping of the upper lid, the presence of a squint, etc.), or by some peculiarity of posture or gait.

Spasms, twitchings and convulsions, may be highly suggestive, as, for instance, the twitchings of the mouth and facial muscles in general paralysis of the insane; the movement of the hands in paralysis agitans; the irregular jerkings of chorea; the peculiar expression in trismus; the violent movements seen in epileptic, hysterical, and tetanic convulsions, etc.

The condition of the hand, suggestive of vigour, languor, etc.[1]; or indicative of distinct and definite disease, such, for example, as the nodose thickening of the joints in chronic rheumatic arthritis, the wasted muscles, and bird-claw appearance of progressive muscular atrophy.

The odour of the breath, skin, discharges, etc., suggestive of alcoholic excess, uraemia, gangrene of the lung, fevers, typhus, cancer of the uterus, etc.

The Diagnosis.—This should be fully stated, the primary disease being first specified, and then the secondary and tertiary complications enumerated. I need not enter into further details, for the subject has been fully considered in the introductory chapter.

The Prognosis: immediate and remote.—After having completed the examination, and presumably come to a conclusion as to the nature of the case, the practitioner must be prepared to give an opinion as to (a) the severity of the attack, the dangers which it involves, its probable duration, course and termination—*the immediate prognosis;* and (b) the results which may remain, the effects they are likely to have on the future health, the risks of recurrence, and the precautions which the patient must take to prevent a return of the disease, and to diminish, so far as possible, the subsequent ill effects of the present attack—*the remote prognosis.*

The prognosis is, to a large extent, based upon the same grounds as the diagnosis. The more full and accurate, therefore, the examination of the case, the more accurate will be the prognosis.

The chief points to which attention is to be directed in forming the prognosis are:—

1. *The nature of the disease.*—As the result of experience we know that some diseases are trivial, others serious, others fatal; some end either in death or in complete recovery, others usually leave injurious results behind them, etc. Acute croupous pneumonia, for example, is

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[1] See *Physical Expression, its modes and principles.* By Francis Warner, M.D.

a serious disease, which is often fatal, but which, when it is recovered from, seldom leaves permanent damage.

2. *The severity of the special case under observation.*—In order to form a correct opinion on this point, knowledge and experience, in addition to a full and accurate examination, are again required, for it is necessary to contrast the symptoms and physical signs of the special case under observation with those of average severity. The experienced practitioner knows that a pneumonia of the apex of the lung, both as regards the immediate and remote prognosis, is, as a rule, more serious than a pneumonia of the base. In chronic cases the effect which the lesion has already produced upon the organ which is primarily affected, and upon the other systems and organs, is a most important point.

3. *The patient's capability of resisting the disease, and the power of compensation he possesses.*—In considering this point a variety of circumstances must be taken into account. The following are some of the chief:—

(a) The age, strength, diathesis, etc., of the patient.—Acute croupous pneumonia, for instance, is almost invariably fatal in old people; diabetes mellitus is, as a rule, much more serious in young than in old people; syphilis usually runs a severe course in persons of a scrofulous diathesis; a bronchial catarrh or common cold, which in the majority of individuals is of trivial importance, is apt, in persons of a scrofulous diathesis to run on to phthisis.

(b) The presence of associated disease.—This is a most important point. Typhus fever, for example, is almost always fatal when the kidneys are diseased or when there is a weak, fatty heart. A trivial bronchial catarrh is of grave significance in cases of stenosis of the larynx; persons whose tissues are degenerated by alcoholic excesses bear acute disease badly—cholera, for example, is almost invariably fatal to drunkards.

(c) The habits, circumstances, and surroundings of the patient materially modify the prognosis; in cases of mitral regurgitation patients who are obliged to follow laborious occupations, who are worried by financial or other matters, who are badly housed, ill fed, and poorly clothed, who are unable to obtain medical advice, or who will not carry out the directions of their medical advisers, who are exposed to the vicissitudes of the weather, or who are given to excesses of any kind, succumb more quickly than those whose circumstances are easy, whose habits are regular, and whose surroundings are pleasant and favourable. In those who are unfavourably situated the lesion progresses more quickly, the capabilities of resistance are not so great, compensation more quickly fails, and complications, such as bronchitis, are much

more apt to arise. In all cases the amount of reserve force possessed by the organ which is primarily affected and by the other organs and tissues; in other words, the amount of compensation which can be put forth, and the amount of resistance which can be opposed to the secondary derangements which result from the primary lesion, are most important.

4. *The effects which are produced by treatment; and (in chronic cases) the progressive or stationary character of the lesion.*

The advisability of communicating to, or withholding from the patient, the exact nature of the disease, is a question which, in some cases, requires careful consideration. When the opinion is favourable it should at once be communicated. A favourable opinion, confidently expressed, is of itself sufficient to effect a cure in many cases; and in a large proportion of severe and bad cases it produces a decidedly beneficial result. An unfavourable opinion should, in most cases, be communicated, sometimes quite candidly, at others in a more or less guarded or indirect manner. Much will depend upon the nature of the disease and the mental temperament of the patient. In acute cases, even when the opinion of the physician is altogether unfavourable, it is right to cheer up the patient as much as possible, and to get him to take a favourable view of the result. In cases of this description wonderful recoveries sometimes take place, and it is the duty of the practitioner to do everything in his power to promote recovery. But while it is essential to buoy up the hopes of the patient, and to avoid depressing him, and so (in some cases) destroy the slight chance of a rally and recovery, the true state of matters must always be communicated to the friends or relatives.

In most chronic cases it is, in my opinion, highly desirable to deal frankly, though the very reverse of abruptly, with the patient, for unless he realises the true nature of the disease, he may not be able to carry out intelligently the instructions as to treatment, and he does not guard himself so carefully as he otherwise would, against conditions which are likely to aggravate the complaint or produce complications. In some cases, the communication should be made in a very guarded manner; and in the case of persons who are very nervous and easily depressed, it is occasionally, though rarely, desirable to withhold the information altogether. In cases of this description the physician should take care to protect himself against accidents, by communicating the exact condition of the patient to some judicious friend or relative, for should this communication not be made, and the disease be subsequently discovered (by some other physician, or by the death of the patient), it may be supposed that the condition was not recognised.

The Treatment.—Our main object is to cure the disease, *cito, tuto, et jucunde*, quickly, safely, and pleasantly; and when, from the nature of the case, a cure is impossible, to relieve the symptoms, to prolong life, and to make the existence of the patient as useful and happy as possible.

(1.) The first indication for treatment is, if possible, to remove the cause of the disease or any contributory cause, *i.e.* anything which is aggravating the disease or contributing to the attack. In *scabies*, for example, we destroy the itch insect by external applications; in obstinate vomiting, the result of a retroflexion of the uterus, we alter the position of that organ; in alcoholic paraplegia and delirium tremens, we cut off the patient's alcohol; in ague we give full doses of quinine, which probably acts by destroying or rendering inert the parasitic organism which recent researches seem to show is the cause of the disease, etc.

(2.) In those cases—and they are numerous—in which we are unable to remove the cause, or in which we do not know the cause of the attack, we place the patient in the most favourable conditions for recovery, endeavour to moderate the severity of the attack, to relieve the symptoms, and to prevent complications and sequelæ.

In carrying out this indication, we (1) attend to the position and hygienic surroundings, the diet and regimen, the nursing, and the habits and whole mode of life of the patient; (2) we look to the condition of the organs concerned in the preparation and elaboration of the blood-plasma or nutrient fluid, of the organs concerned in its æration and propulsion through the body, and of the organs concerned in its purification, and in the removal of the waste products, and we pay special attention to the condition of the nervous system, which exercises such an important influence on all the processes of nutrition: (3) we combat the disease and relieve symptoms by the internal administration of drugs, and the application of external remedies; and (4) last, but by no means least, by encouraging the patient's hopes and allaying his anxieties, and by the mental impression which our presence and opinion produce, we endeavour to stimulate his nervous system, and to enable him to overcome or bear up against the disease.

In carrying out this treatment it is of course essential to see that the patient does not injure himself or others; in the delirium of fever, for example, and in some cases of mental derangement in which there is any reason to suspect a suicidal or homicidal tendency, the patient must be carefully watched and guarded; and in all cases of infectious disease, the greatest care must be taken to isolate the patient, and to prevent the spread of the disease.

A very important part of the treatment and management of the case is to prevent the recurrence of the attack, and to guard the patient against other affections to which his present illness or previous state of health renders him liable.

The plan and scope of this work do not allow me to enter into any details with regard to the manner in which the various points which I have thus boldly enumerated, are to be carried out.

The subsequent course of events.—Full details of the progress of the case while the patient is under treatment must, of course, be entered in the notes, care being taken to emphasise any alterations which occur, any new symptoms which arise, any modification of opinion which may be arrived at, or any alteration in treatment which is prescribed. The exact mode and date of termination must be accurately stated. In fatal cases, however commonplace they may appear, a *post-mortem* examination should invariably be made; the physician ought always to be present; and no effort should be spared to make the examination (both naked eye and microscopical) as thorough and complete as possible. The notes of the autopsy and subsequent microscopical examination should be carefully copied into the case-book.

Finally, the record should be closed with a summary of the leading features and points of interest, and with the critical remarks of the physician regarding the whole case.

CHAPTER III.

THE TEMPERATURE.

In many diseases the observation of the temperature of the body is of the greatest practical importance for the purposes of diagnosis, prognosis, and treatment, for, in the healthy man, who is well fed and properly clothed, it is maintained at practically the same point (about 98·6° F.=37° C.) notwithstanding the alterations in the external (temperature) conditions to which he may be exposed.

Slight variations from this standard—from 97·25° F. or 36·25° C. to 99·5° F. or 37·5° C.—are compatible with perfect health, and, as a matter of fact, are constantly occurring; but any considerable alterations—falls below 97° F., or elevations above 100° F.—indicate a disturbed condition of the organism.

Diurnal Variations.—In health, periodical variations occur during the twenty-four hours. Speaking generally, the temperature rises during the day, and, as a rule, attains its maximum between 4 and 8 P.M.; while it falls during the night, the minimum being usually reached between 2 and 6 A.M. (see fig. 4). These diurnal variations are largely, but not entirely, due to the taking of food and to the changes in the body which accompany its digestion and assimilation.

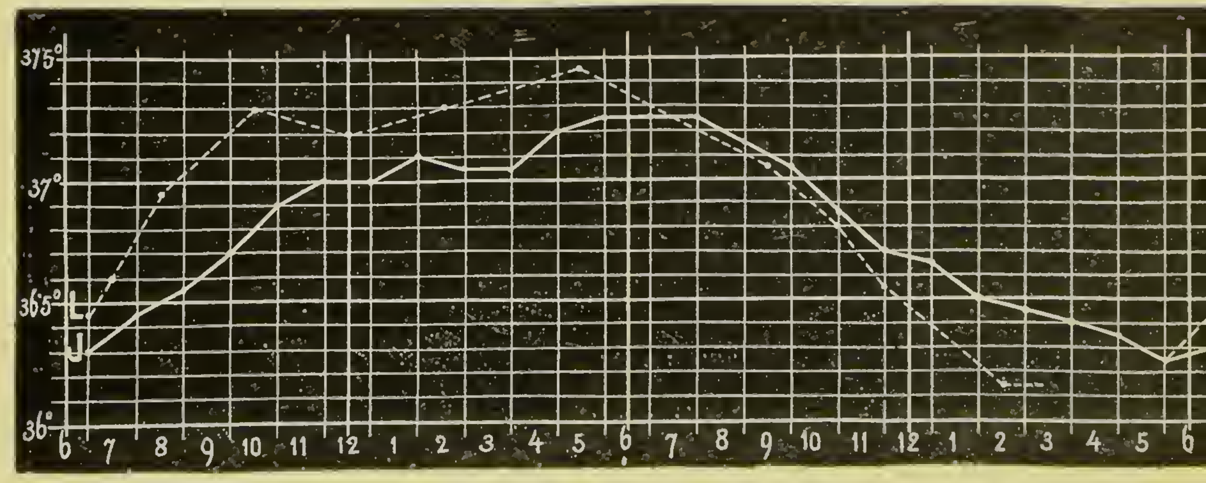

Fig. 4.—Variations in the daily temperature in health during twenty-four hours. L., after Liebermeister; J. after Jürgensen.

Physiological Considerations.—Before describing the clinical methods by which we observe the temperature of the body and the alterations in the body-heat which occur in disease, it will perhaps be well to refer briefly to the manner in which the animal heat is produced and lost, and to the mechanism by which the production and loss are balanced or equalised.

The production of animal heat.—Heat is produced within the body wherever oxidation is going on, and is, therefore, *being constantly generated in all the tissues;* in fact, 'the whole cycle of changes from the lifeless pabulum through the living tissue back to the lifeless products of vital energy is eminently a source of heat.'[1]

The oxidation of the tissues themselves is then the main source of animal heat, but the metabolism of the food in the alimentary canal also contributes. The muscles and great glandular organs, more especially the liver, are the situations in which the animal heat is chiefly produced, the muscles being probably the more important of the two. Wood thinks that 'there are in the animal economy two sources of animal heat: *first,* the destruction which probably occurs in the blood of the excess of crude food material; *second,* nutritive changes in tissue, including all changes in the blood itself, at the expense of its permanent constituents.'[2]

Heat-loss.—Heat is being constantly lost by:—*(a)* conduction, and radiation from the surface of the body and the evaporation of moisture from the skin; *(b)* evaporation of water from the lungs, and heating the expired air; and *(c)* heating the urine and fæces. Authorities differ somewhat as to the exact proportion of the loss from these different channels. According to Dulon,[3] 72 per cent. is lost by radiation and conduction from the skin; 14·5 per cent. by the evaporation of water from the skin; 7·2 per cent. by the evaporation of water in the breath; 3·5 per cent. in heating the expired air; and 1·8 per cent. in warming the urine and fæces. The total loss then is, according to this authority, *from the skin,* 86·5 per cent.; *from the lungs,* 10·7 per cent.; and *with the urine and fæces,* 1·8 per cent.

The regulation of the balance between the heat-production and the heat-loss.—Since in health the temperature of the body remains practically constant, notwithstanding external variations in temperature, it is obvious that there must be some arrangement within the body by means of which the heat-production and heat-loss are so adjusted or balanced that the body is prevented from cooling when it is placed in a cold atmosphere, and is prevented from becoming heated when it is placed in a warm one. There are two possible ways in which this balance might be obtained, viz.: by (1) alterations in the amount of heat which is given off (the heat-production remaining constant), *i.e. regulation by loss*; and (2) alterations in the amount of heat which is produced (the heat-loss remaining constant), *i.e. regulation by production.* Both forms of regulation are probably constantly taking place, though in health, at all events, the regulation by loss is perhaps the more important of the two.

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[1] A text-book of Physiology by Professor Michael Foster, p. 461.

[2] Fever by Professor H. C. Wood, p. 234.

[3] A text-book of Physiology (Landois & Stirling), p. 446. (The percentage in the original is that stated in the text. I am unable to say where the error lies.)

Regulation by heat-loss.—It has been stated above that no less than 86·5 per cent. of the total heat lost is discharged from the surface of the skin, either by conduction, radiation, or the evaporation of sweat. The amount of heat which is discharged in this way at any given time varies greatly, and depends upon *(a)* the condition of the circulation; *(b)* the condition of the skin itself; and *(c)* the amount of sweat secretion.

The condition of the circulation.—When the circulation is active and the vessels of the skin dilated (as is the case, for example, during active muscular exercise and during the height of febrile diseases), the amount of blood in the skin or surface circulation, as we may term it, is (compared with the amount of blood in the deeper and heat-producing parts) comparatively great, a large amount of heat is brought in a given time to the surface of the body, and a large surface loss consequently takes place; *vice versâ,* when little blood is passing through the surface circulation, when the circulation is inactive or the blood-vessels contracted, heat is retained in the deeper tissues, for comparatively little heat being brought to the surface the heat-loss is small.

The condition of the skin itself.—When the skin is soft, its meshes filled with fluid, and its vessels dilated, it is a much better conductor of heat than when it is shrivelled, dry, and its vessels constricted. In the former case a much larger amount of heat is consequently given off from the surface of the body than in the latter.

The condition of the sweat glands.—When the skin is moist a considerable quantity of heat is lost in the evaporation of surface moisture; the secretion of sweat, then (which is probably directly dependent upon nerve arrangements) favours the loss of heat from the surface of the body.

Influence of the vaso-motor system.—It is obvious from what has been stated, that the vaso-motor nerves regulating the condition of the blood-vessels in the skin must exercise a most important influence upon the heat-loss, and therefore upon the temperature of the body. The temporary application of moderate cold to the body, for example, stimulates the vaso-motor nerve filaments in the skin, and causes reflex contraction of its blood-vessels;[1] the blood is driven into the deeper tissues; the amount of heat carried to the skin is lessened; the conduction power of the skin is also diminished, the heat-loss is most materially lessened, and the temperature of the body is kept up, in other words, the cooling of the body is prevented. The immersion of the body in a cold bath and the application of iced cloths to the surface, abstracts heat in fever, as will be afterwards explained. On the other hand, the application of heat to the surface causes dilatation of the blood-vessels, renders the skin a better conductor of heat, increases the heat-loss, and so prevents the heating of the body.

The great vaso-motor centre is situated in the medulla oblongata, but there are also vaso-motor centres all down the spinal cord. Whether the blood vessels in the skin are regulated by the main centre in the medulla or by subordinate centres in the spinal cord, is not definitely known. It may perhaps be supposed that while the abdominal or deeper circulation is governed by the main vaso-motor centre in the medulla (through the splanchnics), the superficial or skin circulation is regulated by the subordinate vaso-motor centres in the spinal cord; and that these two vaso-motor centres are differently affected by the same stimuli. If this were so, we might suppose that surface stimuli, such as cold, which cause contraction of the superficial or skin vessels, produce, at the same time dilatation of the deep or abdominal vessels. Such a view is largely theoretical, and has only been suggested in order to render the conception of the regulating balance more vivid and distinct.

The effect of respiration on the heat-loss.—The more frequent the respiration and the quicker the circulation through the lungs, the greater is the heat dissipation from the lungs which, under normal circumstances, amounts, as we have seen, to 10·7 per cent. of the total heat-loss.

To sum up then, the application of heat to the surface of the body or the increased production of heat within the body increases the frequency of the heart's action, quickens the circulation through the skin, dilates the superficial blood-vessels, produces a relaxed condition of the skin, and quickens the respiratory movements; in other words, produces the very conditions which favour the loss of heat, and which are required to restore the balance. *Vice versâ*, the application of cold to the surface of the body or the diminished production of heat in the body, slows the circulation, causes contraction of the superficial vessels, renders the skin contracted and a bad conductor of heat, and diminishes the number of respirations, in other words, produces the very conditions required for the diminution of the heat-loss and for the maintenance of the body temperature.

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[1] Possibly cold, applied to the surface of the skin, may also act directly upon its blood-vessels.

But this is not all, for the temporary application of a *moderate degree* of heat or of cold to the surface of the body also seems to diminish or increase the amount of heat produced within the body, a point which must now be considered.

Regulation by variations in production.—The chief source of animal heat is, as has been seen, the metabolism going on in the muscles and great glandular organs, more especially the liver; and there are reasons for supposing that these metabolic changes, which result in the production of animal heat, are under the control of a nervous mechanism—that such a nervous mechanism does exist seems proved by the facts that the temporary application of *moderate* cold to the surface of the body is followed by an increase of the body temperature, and by *an increased consumption of oxygen and an increased production of carbonic acid;* and, on the other hand, the temporary application of *moderate* heat to the surface produces a fall in temperature and *a diminished metabolism* as measured by the consumption of oxygen and the production of carbonic acid.

Whether the action of the nervous centre, which is supposed to regulate the production and loss of animal heat, is constant and automatic, or whether it is intermittent and only brought into play by appropriate stimuli; whether it restrains the metabolic changes and diminishes the heat production, or whether it augments those changes and increases the heat production, is unknown. Professor Wood seems to think that the action of this centre is constant and automatic, and that it acts as an inhibitor or restrainer of tissue metabolism, and that it may be stimulated or inhibited by different stimuli, the tissue metabolism and heat production being of course diminished in the former case and increased in the latter. He discusses the question as to whether this so-called heat centre is simply a vaso-motor centre for the muscles, or a centre inhibiting tissue metabolism; and concludes 'that the heat production, following section of the medulla, is not due to an influence exerted upon the circulation, but directly upon the heat-making function. The theory that teaches the existence of a nerve centre in the pons or in the brain above it, which by a direct action inhibits the production of animal heat, seems therefore to be most in accord with all the evidence upon the subject, and I am myself,' he says, 'disposed to adopt it as very probable.'[1] Instead of supposing with Wood that the action of this centre is inhibitory, that it is, in short, a restrainer of those tissue changes which result in the production of animal heat, it might be theorised, *firstly*, that there exists in the pons or medulla a centre which augments and keeps going the tissue changes which result in the production of animal heat; and, *secondly*, that the action of this lower or heat-producting centre is restrained or kept in check by impulses passing to it from centres situated either in the mid-brain—the region of the basal ganglia, in the cerebral cortex, or in both.

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[1] Page 157.

If we accept this view, we may theoretically suppose that the action of the lower or heat-generating centre can be intensified and heat-production increased, or inhibited and heat-production diminished, by different stimuli. Further, we may suppose that the action of the heat-producing centre and of the vaso-motor centre for the skin is intensified by the same stimuli; the diminished heat-loss and the increased heat-production which result from the application of moderate cold to the surface of the body, and the increased heat-loss and diminished heat-production which result from the application of moderate heat to the surface of the body being in this way explained.

Leaving these physiological conditions to which, however, I shall have again to refer when the theory of fever comes under discussion, the practical aspects of the subject must now be considered.

Mode of estimating the Temperature at the Bedside.—The temperature or body-heat of the patient may be roughly estimated by the hand of the observer, but is accurately measured by means of the clinical thermometer.

Clinical thermometers.—Mercurial thermometers, such as those represented in fig. 5, have hitherto been generally used for clinical purposes, the self-registering maximum thermometer, in which the index is formed by a detached portion of the mercurial column, being the most convenient; the top of the index points to the temperature. Quite re-

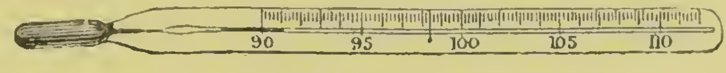

FIG. 5—A.

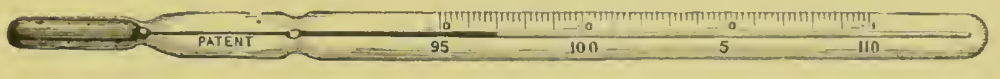

FIG. 5—B.

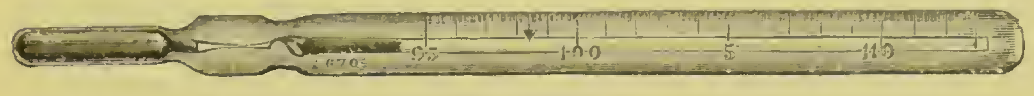

FIG. 5—C.

FIG. 5.—Various forms of the Self-Registering Mercurial Clinical Thermometer.—A, Cassella's 'Infallible' clinical thermometer; B, 'Ferris' Perfect' clinical thermometer; C, Evan's and Wormull's 'Standard' clinical thermometer.

cently a metallic thermometer (see fig. 6), which claims to be less destructable than the ordinary glass instrument, has been introduced by Immisch. The graduation of a thermometer should be distinct, and its accuracy from time to time verified.[1]

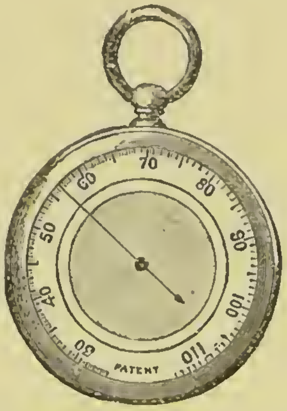

FIG. 6.—*Metallic thermometer of Immisch.*

Surface thermometers.—Local variations in temperature may be measured by the ordinary instrument in the manner which will be afterwards described, but are better ascertained by one or other of the special forms or 'surface thermometers.' Where extreme delicacy and absolute accuracy are required, a *thermo-electric apparatus* is necessary. A continuous record of the temperature may be obtained by means of the *thermograph,* which is self-registering.

Mode of using the Clinical Thermometer, and the precautions to be taken in making Thermometric Observations.—1. *Shake down the index well below the level of the normal temperature.* 2. *Place the instrument in position.* The axilla, rectum, and mouth are the situations which are usually selected, but for special purposes it may be necessary to introduce the instrument into the vagina.

The axilla.—This is the most convenient situation, and in the ordinary routine of practice the observation of the axillary temperature is usually all that is required. The bulb of the thermometer should be introduced well into the axilla under its anterior or pectoral fold; the cavity of the axilla must then be closed, by bringing the patient's arm in contact with his side, the forearm being placed across the chest.

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[1] It is well known that mercurial thermometers, at the temperatures used in medicine, increase their readings with age, and much more rapidly for the first few months after the instruments have been made than at any subsequent time. Most good makers lay the tubes aside for two years before filling them with mercury. The plan which has been adopted by some makers, of having each instrument, before it is put into the shops, tested at Kew, and any errors in reading engraved on the glass tube, is admirable.

When the patient is sweating profusely, the axilla should be dried with a soft towel before the instrument is introduced. After the introduction of the instrument, the patient must be told to keep his arm still, the cavity of the axilla being kept closed until the instrument is withdrawn.

The normal temperature in the axilla is about 98·6° F.

The rectum.—In all scientific observations, where strict accuracy is required; in all cases in which there is any reason to suspect a difference between the temperature of the interior and of the surface of the body (as in collapse, rigors, etc.); and in all cases in which an unusual or unexpected temperature is obtained in the axilla, the temperature should be taken in the rectum. Again, in children the rectum is often the best situation, for it is sometimes difficult to retain the instrument in the axilla.

In taking the rectal temperature, the patient should be placed on his left side with the thighs semi-flexed upon the abdomen. In the child the rectum is generally a more convenient situation than the axilla; for the thermometer can, in many cases, be easily introduced while the child lies on its nurse's knee. The bulb of the instrument, which has been first slightly warmed by holding it in the hand and then oiled, should be passed for two inches into the bowel,—care being taken that it does not become embedded in a mass of fæces.

The normal temperature of the rectum is about ¾° F. higher than the axillary temperature, *i.e.* about 99·4° F.

The mouth.—In out-patient and dispensary practice the temperature may be observed by placing the instrument in the mouth, the bulb of the instrument being placed under the tongue and the mouth kept closed during the observation; personally I prefer to take the temperature either in the axilla or rectum. The temperature of the mouth is about 98·6° F.

In washing the instrument after taking the temperature of the mouth or rectum, care must be taken not to use hot water, lest the mercury be driven to the top of the tube and the instrument spoiled.

3. *Retain the instrument in position for a sufficient time; and if it is not self-registering read it while still in situ.*—The time which the instrument must remain *in situ* varies with the situation which is selected. The only certain guide is to ascertain by *personal observation* that the mercury has reached its maximum, *i.e.* that it is stationary. For ordinary purposes *from ten to fifteen minutes in the axilla, and five minutes in the rectum and mouth* are sufficient. In making surface observations, taking the temperature of the thigh for instance, twenty minutes at least are required.

It is sometimes necessary to *hold the instrument in situ*; as, for example, when the patient is extremely debilitated, when he is mentally incapacitated, comatose, delirious, etc. Hospital patients who are accustomed to the habitual use of the thermometer, sometimes fall asleep while it is in the axilla; the instrument is, under such circumstances, apt to become displaced, and the observation valueless; not unfrequently, too, the thermometer gets broken. Whenever it is necessary to hold the instrument in position, the nurse should be instructed to see that the arm is held against the side and the axilla kept closed.

4. When there is reason to suspect imposition, and in all cases where the reading of the mercury is *extraordinary*, as for example in some of the so-called 'elephantine' temperatures of hysteria, the physician should himself hold the instrument in position. In cases of this description, the observer must see that there is no external source of heat, such as a hot bottle or poultice near the patient, and that the elevation of the mercury is not due to friction of the patient's arm against the bulb, which have been suggested as possible causes of the extraordinary high temperatures which are sometimes met with.

The accuracy of an instrument registering an extraordinary temperature (either very high or very low) should always be suspected. In such cases it is a good plan to take several simultaneous observations, different instruments being placed in the axilla, mouth, rectum, etc.

5. In observing the course of the temperature in any case in which great accuracy is required, it is desirable *to use the same instrument for each observation*, for the reading of different thermometers varies somewhat, and even if the amount of error is known the necessary calculation is troublesome and apt to be forgotten.

6. It is also desirable to make the observations *at the same time of day*, for, as has been previously pointed out, variations occur at regular intervals during the twenty-four hours.

For practical purposes, two observations, say at 9 A.M. and 7 or 8 P.M.—are usually sufficient; but in special cases, more particularly where an accurate record is required for scientific purposes, it may be desirable to take the temperature more frequently.

7. The condition of the pulse and respiration, the state of the skin (whether dry or moist), and the general state of the patient (the presence of collapse, rigors, etc.) should be noted at the same time as the temperature is observed.

It is of the greatest importance to remember that here, as in all departments of medicine, attention should never be exclusively directed to any one symptom or sign, but that the physician should observe *everything*, and endeavour to take a comprehensive and all round view of the case. Serious errors may easily arise from concentrating the attention exclusively on the temperature; for example, the fall, which occurs in some grave febrile diseases immediately before death, may be mistaken for the favourable defervescence of the fever; or again, the enormous elevations which occur in some cases of hysteria, which are sometimes fictitious, and seldom if ever attended with danger, may be considered indicative of impending death.

THE TEMPERATURE IN DISEASE.

In disease the temperature may be normal, increased, or diminished, and the elevations and depressions may be general or local.

Normal temperature in disease.—In many chronic affections, such as chronic bronchitis and locomotor ataxia, the temperature remains unchanged. A normal temperature is occasionally a negative diagnostic sign of some value; if, for instance, the temperature was normal in a case of deep-seated and ill-defined tumour, an inflammatory condition would probably be contra-indicated.[1]

INCREASED TEMPERATURE; FEVER; PYREXIA.

A large number of diseases, notably the acute specific fevers and acute inflammations, are attended with a general elevation of temperature, which is termed *pyrexia* or *fever*.

It is important to remember that inflammatory affections are not invariably accompanied by the degree of elevation of temperature which we term pyrexia. In peritonitis, for example, the result of perforation of the intestine; and in pneumonia occurring in the course of uræmia, the temperature may never rise above the normal. The explanation of these apparent exceptions to the general rule—that, inflammation is attended with fever—is probably to be found in the fact, that the original condition (perforation of the intestine and uræmia, in the cases I have mentioned as examples), very markedly depresses the temperature, and although the subsequent inflammation produces an elevation (which relatively to the low temperature may be regarded as a state of pyrexia), yet it fails to raise the temperature above the standard point of health. In cases of this description, unless the observer takes into account the fact, that there is a condition present which produces depression of temperature, he may easily fall into the error of supposing that he has to deal with an inflammation which is unattended with elevation of temperature, in other words, with pyrexia.

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[1] I do not say *certainly* contra-indicated, for a deep-seated chronic abscess may, as we all know, be unattended with any general elevation of temperature.

Hence the important diagnostic indication, that if a local inflammation is unattended with the usual elevation in temperature which we term pyrexia; uræmia, diabetes, or some of the other conditions which cause depression of temperature should be suspected and looked for.

THEORY OF FEVER.

The exact cause of the elevation of temperature, which is the most striking and characteristic feature of fever, has been a subject of much debate. Theoretically an increased body temperature might be due to *(a)* increased heat-production; *(b)* diminished heat-loss; or *(c)* a combination of both conditions (increased heat-production and diminished heat-loss)—and as a matter of fact all three may probably be the cause of increased body temperature. Authorities seem, however, to be agreed,[1] *firstly*, that in the vast majority of cases, *fever is mainly due to increased heat-production*;[2] and *secondly*, that the cause of this increased heat-production is *an increased metabolism of the accumulated tissue material of the body.*

The tissues in which this metabolism takes place are, in all probability, either the muscles or the blood corpuscles, or both. In support of this proposition Dr Burdon Sanderson (after directing attention to the investigations of Dr Salkowski on the secretion of potash and soda-salts in the urine in conditions of health and fever) says, 'The augmented production of urea in fever must take place at the expense of some source of albumin which contains potash. The albumin, therefore, which serves as a source of urea in fever is not derived from liquor sanguinis (for the liquor sanguinis abounds in soda salts, but contains very little potassium), but either from the blood corpuscles or from the muscles, or both.'—The increased discharge of colouring matter in the urine which occurs in fever is also, he adds, another fact (in addition to the increased excretion of potash) in support of the view that the chief seat of disintegration in fever is in the muscles or red blood corpuscles.[3]

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[1] This lecture was written before the publication of Dr Ord's views (see page 70)

[2] Prof. H. Wood says: 'It seems certain that what is habitual in the lower animals is at least occasional in man, and that elevation of temperature may co-exist in man with diminished heat-production, and that lowered or normal temperature may co-exist with diminished heat-production, and that lowered or normal temperature may co-exist with increased tissue metamorphosis or chemical movement. Most practitioners of medicine have seen cases of increased tissue change, as shown by emaciation and excessive urea secretion without elevation of temperature; or fever cases, in which the temperature seemed so out of proportion to the results upon the bodily tissues as to indicate irresistibly that heat retention was playing an important part in producing the fever; or collapse coming on in fevers when sudden fall of temperature seemed inexplicable in any other way than by a sudden loss of heat.'—*Fever*, page 240.

[3] Reports of the Medical Officers of the Privy Council and Local Government Board, New Series, No. VI., 1875.

The exact manner in which the increased tissue metabolism, which is the cause of the augmented heat-production of fever, is produced, is not definitely known.

Many febrile diseases are undoubtedly due to the introduction into the system of a particulate, organic poison; and there is every reason for supposing that the increased tissue metabolism, which is the primary cause of fever, is brought about by the presence of that particulate poison in the blood, or by the absorption into the blood of some chemical poison generated during its multiplication and growth. We may take it for granted, therefore, that in many of the specific fevers and inflammations, the increased metabolism results from the presence in the blood of a poison either of an organic or chemical nature.

This poison may theoretically be supposed to act either directly upon the tissues, inducing *primary* metabolic changes; or *through the central nervous system*, *i.e.* through the heat-generating mechanism, the construction of which I have previously attempted to explain. Fever, in short, as Wood puts it, may be either *hæmic* or *neurotic* in origin.

To recapitulate:—*Fever of hæmic origin.* In this form, a poison either of an organic or chemical nature is supposed to be present in the blood, and to exert a direct irritating effect upon the tissues (probably upon the muscles or red blood corpuscles in particular) in consequence of which an increased metabolism, and therefore an increased heat-production takes place.

Fever of neurotic origin.—In this form, the increased tissue metabolism is due to over-activity of the heat-generating centre which we have supposed to be present either in the pons or medulla oblongata. A variety of conditions may be supposed to stimulate or bring about overaction of this generating heat centre, amongst which the following are some of the chief:—

1. *The presence of a poison in the blood.*—It has been already stated that there is every reason to suppose that many febrile disorders are due to the presence of a poison—either of an organic or chemical nature—in the blood. Theoretically, this poison may be supposed to produce fever, either:—*(a)* by stimulating (acting directly upon) the heat-generating centre: or *(b)* by stimulating the higher centre which (I have supposed) restrains or inhibits the action of the heat-generating centre in the pons or medulla.

2. *Reflex irritation*, arising either at the surface or in the interior of the body. Under this head cases of so-called 'irritative fever' (*i.e.* fever due to the direct irritation of peripheral nerve endings would be included). Cases of this description certainly do seem to occur, but according to Dr H. Wood they are rare. The mild febrile disturbances which accom-

pany teething, some forms of gastro-intestinal irritation in children, and some other localised affections of an irritative, or perhaps even of an inflammatory character may perhaps be included under this head.

3. *Central disease of the nervous system.*—It is well known that in many diseases of the central nervous system, derangements of the body heat occur. Space does not permit me to enter into this very interesting question, further than to state the following theoretical propositions, illustrations of which may, I believe, be actually met with in practice.

(a) Lesions in the pons or medulla, which totally destroy the heat-generating centre, would be attended with the total cessation of the production of heat in the formed material of the body. It is needless to add, that such lesions are incompatible with the maintenance of life.

Partial destruction of the heat-generating centre does perhaps occur. but such cases—in which the heat-production would be more or less interfered with, and the temperature more or less below the normal—are probably rare.

(b) Lesions in the pons or medulla which irritate the heat-generating centre would be attended with an augmented metabolism and increased production of heat. It is probable that cases of this description do actually occur.

(c) Lesions of the brain, which destroy the centres, which inhibit or restrain the heat-generating centre, or which destroy the conducting fibres between the higher and lower centres, will allow of the unrestrained action of the heat-generating centre, and will therefore be attended with an augmented heat-production. *Vice versâ*, lesions of the brain which irritate the higher centres or the conducting fibres between the higher (restraining) and lower (producing) centres, will produce diminished action of the heat-generating centre, and will therefore be attended with diminished metabolism and diminished heat-production. Both of these lesions are probably of frequent occurrence in practice. The fall of temperature which attends collapse or shock, the modifications in temperature (both elevations and depressions) which are met with in cerebral hæmorrhage, the extraordinary modifications of the body-heat which are met with in some cases of hysteria, may all, I think, be explained in this manner.

(d) Further, the diminished heat-production which attends poisoning by urari, in which the terminal branches of the conducting fibres are paralysed, and the alterations in temperature which result from lesions of the spinal cord, may all, I think, be satisfactorily explained by supposing that the lesion either destroys or irritates the conducting fibres which may be supposed to pass from the heat-generating centre through the spinal cord, to the tissues or heat-producers.

It must not, however, be thought that the sole cause of fever is some alteration of the heat-producing mechanism; on the contrary, it is essential to remember that, in fever, the condition of the vaso-motor nerve apparatus and the heat-expenditure and heat-loss are also profoundly modified; that there is, in short, a disturbance of the delicate nerve balance which regulates the heat-production and heat-loss. In any given case of fever the height which the temperature attains is the resultant of these two conditions, viz.: the amount of heat which is being produced and the amount of heat which is being lost, at the time the observation is made.

To sum up, there seems good reason to suppose:—

(1.) That in most of the continued fevers and in many inflammatory affections the primary cause of the fever is the presence in the blood of a particulate, organic poison, or the absorption into the blood of a chemical poison produced by the multiplication and growth in the blood or tissues of a minute living organism.

(2.) That this (organic or chemical) poison may theoretically produce fever either by directly inducing increased metabolism of the tissues more especially concerned in the production of animal heat (probably the muscles and red blood corpuscles); or indirectly through the nervous system, the latter view being in all probability the more correct.

(3.) That in the earlier stages of the fever (during the cold stage of intermittent fever or ague for example) the fever poison may be supposed to stimulate the vaso-motor centres for the skin, producing constriction of the blood-vessels, and causing greatly diminished heat-loss, while it at the same time increases tissue metabolism and heat-production, either by directly stimulating the heat-generating centre or by paralysing (inhibiting) the action of the higher or heat restraining centres.

(4.) That during the height of the fever (the hot stage of intermittent fever) the over-action of the vaso-motor centre gradually subsides, the blood-vessels dilate, and the heat-loss from the surface of the body becomes greatly increased, while the action of the fever poison on the heat-generating centres and the increased production of heat are still further augmented. Further, it must be remembered that the increased temperature quickens the action of the heart and the frequency of the breathing, and so leads to increased heat-loss from the respiratory surface in the manner previously described. (See page 59.)

(5.) That during the third stage of the fever or the stage of defervescence (the sweating stage of intermittent fever), the action of the fever poison on the nerve centres ceases, either suddenly or gradually (defervescence by *crisis* or *lysis* respectively), and that in the former case more especially (defervescence by crisis) the heat-loss from the surface of the body is very great (often greater than it was during the hot stage of the fever), being in many cases accompanied by, and probably, in some cases largely due to, copious perspiration.

During the period of defervescence, then, the heat-loss is very great while the heat production may be *(a)* above the normal (in the earlier periods of the stage of defervescence), *(b)*, normal, or *(c)*, subnormal.

Dr Ord's views on the theory of fever.—Since this lecture was written a very suggestive and original address on the causation of pyrexia was delivered on the opening of the Medical Society of London by its President, Dr Ord.

Starting with the statement of Dr Burdon Sanderson 'that although as compared with the heat-production of an individual on fever diet, the heat-production of a fevered person is excessive, it is not by any means greater than the heat-production of health,' and that it must be admitted that there is in fever increased exhalation of carbonic acid, increased excretion of urea, but that after calculation they do not represent a source of heat sufficient to cause the increased temperature of the body, he states that he is unable to accept this increased combustion explanation which formerly satisfied him.

'Is it possible,' he asks, 'that the increased heat of fever may be brought about by the cessation of processes in which heat ought to be used up, either as motion or chemical action, or other kind of energy? . . . Is the increment of heat of body in fever due not only to combustion or other disintegrative process thereto allied, but also to the persistence, in the form of heat of energy which should have taken another form? 'This,' he says, 'appears to me in a high degree probable. Throughout the body we recognise two processes ever going on; the building up of tissues on the one hand, their disintegration on the other. The disintegration of tissues is clearly attended by the liberation of heat. Their building-up presents itself to me as necessarily attended by the consumption or disappearance of heat, which assumes some other form of energy, kinetic or potential. . . There is,' he says, 'no direct (experimental) evidence, but we may gain some help from a consideration of the chemical processes in fever. These comprehend, in the first place, an exaggeration of the combustions of health. But they also comprehend changes which exactly reverse those of health, and indicate strongly that there is, first, a cessation of changes which occur in health; and secondly, a production of changes not occurring in health. The proportions of soda and potash which should be eliminated from the body in health are reversed in fever. The same holds of chlorides and phosphates. The potash and the phosphates are the associates of the highly organised principles; the chlorides and the soda of the introduced and further organised principles. On the view that there is, in fever, arrest or default of the building up of the tissues, we can imagine the retained chlorides and soda waiting with the organic substances on promotion, like salmon at the foot of a fall, till, at the end of a fever they part with their associate organic matters, and pass on to the elevating influence of the potash and phosphates. We can imagine the potash and phosphates during fever swept away as useless, because in the arrested ascending metabolism, they have nothing wherewith to combine, and are, for the time, useless, fit only for the draught. It is in fact presented to me strongly that these chemical variations indicate the cessation, in various degrees, of that process of tissue building, which should in health use up heat, and which, ceasing in fever, leaves heat to run wild.' He next detailed some ingenious experiments as the temperature of growing cucumbers and bananas which, so far as they go, seem to support this view; and finally states: 'I believe that in the production of fever-heat, there is a first factor of increased oxidation or combustion, or disintegration, setting free heat. I cannot, however, find this sufficient to account for all the increase of fever observed in pyrexia, and still more in hyper-pyrexia. The further increment I believe to be furnished by heat going astray in default of correlative change in metabolism. And, like Dr Broadbent, I am inclined to recognise in the nervous system the power, inciting, on the one hand, to disintegration, controlling, on the other, the nutritive functions. . . . What I would suggest is, that in all fever, slight or intense, there is, superadded to the combustions which we recognise, an influence of the nervous system, a trophic influence, arresting processes in which heat should be transformed; and that the increasing temperature of fever is determined by increase of this inhibitory influence.'

Degrees of fever and their significance.—Although the greatest differences are met with in the amount or degree of fever which is present in different cases of disease, yet when a large number of cases of the same disease are observed, an (average) temperature chart, characteristic of that disease, can be constructed.

Slight fever (100° F. to 101·5° F.). Slight elevations of temperature to which the term 'slight fever' may be applied, are of common occurrence, and of comparatively little importance. Many catarrhal affections, slight inflammations, gastric disturbances, and localised nerve irritations are attended with slight fever.[1]

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[1] Wunderlich classifies temperatures between 99·5° and 100·4° F. as *subfebrile*; and temperatures between 100·4° and 101·3° F. as slightly febrile.

Moderate fever (101·5°—103° F.) is met with in the less severe forms of inflammation, in acute influenza, acute articular rheumatism without complications, facial erysipelas and many other conditions.[1]

High fever (103°—106° F.) occurs in the more severe forms of inflammation, and in many of the specific fevers (see charts of typhoid, typhus, pneumonia, figs. 7, 9, 24, pages 73, 74, 89). It is important to remember that in children the temperature is very mobile, and a degree of high fever, 105° or 106° F., has not necessarily in them the same significance as it has in adults. On the other hand, in old people the temperature is less mobile than in healthy adults; in them a temperature of 104° F. would indicate high fever.

Hyperpyrexia (107° F. and upwards)[2] is met with in the most severe and malignant inflammations and fevers, in some cases of acute articular rheumatism; and in some affections of the nervous system (some cases of tetanus, traumatic cerebral meningitis and hysteria), in relapsing fever, and in many cases just before death (see figs. 12, 15, 17, 28, pages 77, 82, 83, 99)..

A hyperpyretic temperature is usually a symptom of grave significance, and indicative of a fatal termination. There are, however, some notable exceptions to this general statement (cases of relapsing fever and hysteria, for example). It may be stated as a general rule, that energetic measures (cold bathing or the application of iced cloths to the surface of the body) should immediately be taken to reduce the temperature whenever hyperpyrexia is observed.

The comparative value of single and repeated thermometric observations.—A single observation simply shows the condition of the temperature at the particular time when the observation is made, and is of much less importance than a series of consecutive observations made at frequent and regular intervals.

If the temperature is distinctly elevated, it is justifiable to conclude as the result of a single observation, that a condition of derangement or disease is present; and from the height of the temperature it is in many cases possible to form some conclusion as to the severity of the attack. The converse proposition, viz., that when the temperature is normal, there is no febrile disease present, does not hold good; in intermittent fever and pyæmia, for example, the temperature may at one period of the day be quite normal, at another, hyperpyretic (see fig. 12, page 77). This apparent discrepancy may, I think, be explained by looking upon each rise of temperature in ague or in pyæmia as a separate and distinct fever, due to the absorption of a fresh dose of the fever poison. This view, which I have for long taught, will be again referred to.

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[1] For a complete list see Wunderlich's Medical Thermometry (translated by the New Sydenham Society), to which I am deeply indebted.

[2] Wunderlich applies the term *hyperpyrexia* to temperatures which approach and exceed 107·6° F.

By frequent observations, repeated at regular intervals, we determine the *course of the temperature;* and this in many cases gives us most important information both for the purposes of diagnosis, prognosis, and treatment.

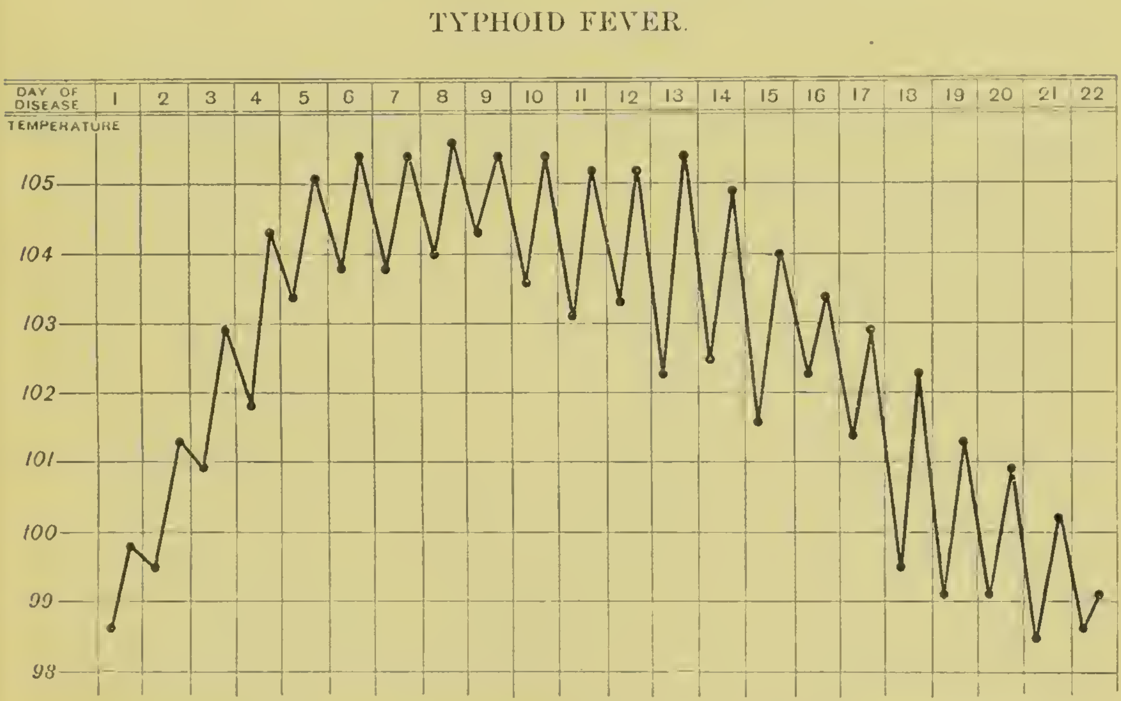
By observing the course of the temperature we are in many cases able to determine:—

(1.) The nature of the disease which is present; for some affections, such as typhoid, relapsing, and typhus fevers, have distinct and characteristic temperature charts (see figs. 7, 8, and 9).

(2.) Whether the disease in the particular instance under observation is conforming to the average type; whether it is severe; whether it is attended with complications (see fig. 10) or relapses.

(3.) Whether the return to health is complete and satisfactory, the convalescence unduly slow, etc.

(4.) The effects of the remedial measures which are being employed; in fact, by observing the course of the temperature we obtain, in many cases, most important indications for treatment.



TYPHOID FEVER.

FIG. 7.—*Chart showing the course of the temperature in a mild case of Typhoid Fever from the first day of the attack.* (*After Wunderlich.*)

RELAPSING FEVER.

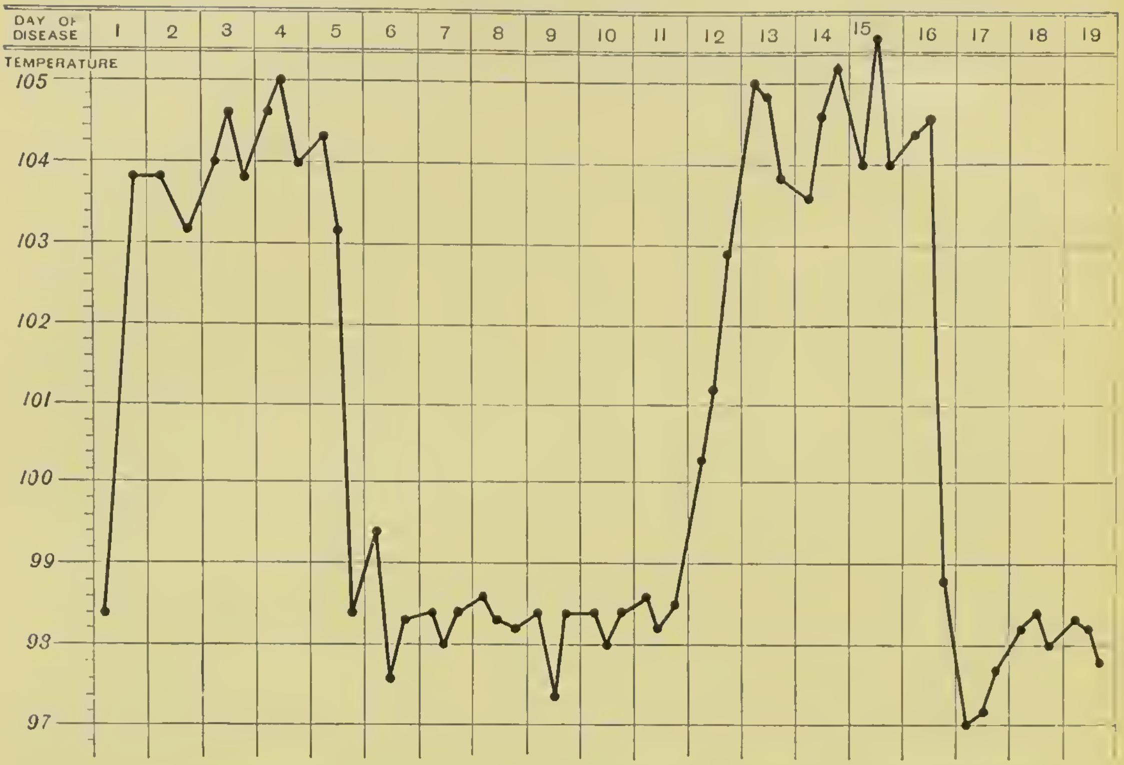


Fig. 8.—*Chart showing the course of the temperature in Relapsing Fever from the first day of the attack. (After Murchison.)*

TYPHUS FEVER.

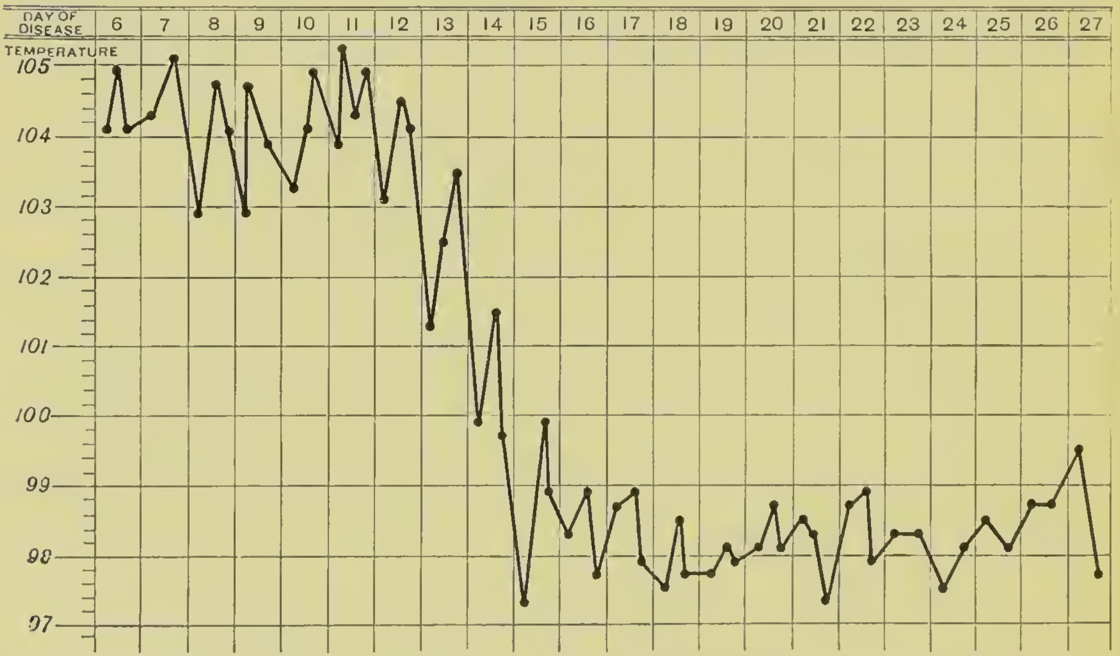


Fig. 9.—*Chart showing the course of the temperature in Typhus Fever. (After Murchison.)*

TYPHOID FEVER WITH HÆMORRHAGE.

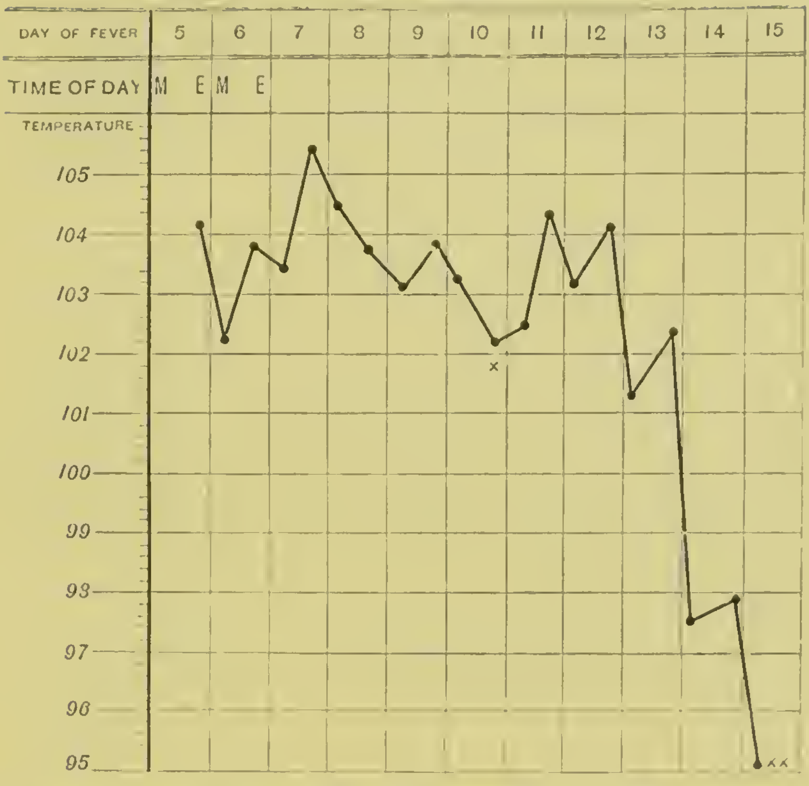


FIG. 10.—*Chart in a case of Typhoid Fever showing a marked fall in temperature the result of intestinal hæmorrhage.* (*After Redard.*)

× A slight fall after the administration of an Antimonial draught.

× × Marked fall, the result of intestinal hæmorrhage. Death took place two hours after the last observation of the temperature.

TYPES OF INCREASED TEMPERATURE OR FEVER.

Two great types of fever, the 'continued' and the 'intermittent,' are usually described.

The continued type of fever.—In the 'continued' fevers, the temperature remains above the normal until the disease has at last reached its maximum development. In exceptional cases it may descend below the normal as the result of some special accidental circumstance, but speedily rises again to fever height.

In the continued fevers the temperature does not remain constantly at the same height. There are, in fact, three stages in every fever, viz.:

(1.) The stage of increase or development during which the temperature rises; the initial or pyrogenetic period.

(2.) The stage of full development or height (the fastigium as it is sometimes technically termed), during which the temperature continues at a high point.

(3.) The stage of defervescence, during which the temperature declines.

During each of these stages *diurnal variations* occur. In most cases, the temperature falls in the early morning and rises in the evening, just as it does in health (see page 56); but in some, as, for instance, in the fever which accompanies some cases of tuberculosis, the order is reversed, the temperature rising in the early morning and falling in the afternoon and evening. The extent of the daily variations is usually greater than in health.

In some cases, the extent of the daily variations is so considerable that a special term, *remittent,* is given to the type of fever. I would, therefore, define a remittent fever as a continued fever *(i.e.* a fever in which the temperature remains above the normal until the disease has at least reached its maximum development) in which the extent of the daily variations is much greater than normal.[1] In the later stage of typhoid the temperature curve is often typically remittent.

Fever of a continued type is chiefly characteristic of localised inflammations, and of those specific fevers in which the fever poison undergoes a single development in the system (pneumonia, typhoid, typhus, etc., see figs. 7, 9).

The intermittent type of fever.—Here the temperature, instead of remaining above the normal during the course of the disease, falls every now and again below it, the elevations of temperature or separate paroxysms of fever being interrupted once or more by apyretic periods. Each period during which the temperature is above the normal may, I think, be conveniently regarded as a separate and distinct attack of fever. I regard diseases, such as intermittent fever and relapsing fever, in which this type of temperature curve is observed, as consisting of repeated attacks or relapses of fever. In some cases, as in 'relapsing fever' and malarial diseases (ague or intermittent fever), the relapses occur at regular intervals (see fig. 11); the attacks of fever are, in short, periodic. In others, as in pyæmia and the nervous fever of hysteria, the relapses are altogether

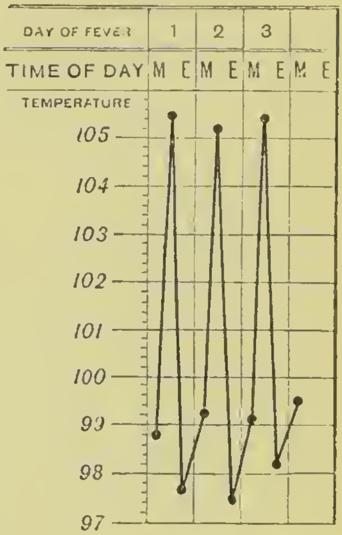


FIG. 11.—*Diagram showing the course of the temperature in quotidian Ague.*

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[1] In the so-called 'remittent fevers' of the tropics, the temperature frequently descends below the normal, and the type of the fever is, therefore, strictly speaking, intermittent, not remittent.

irregular and haphazard in their occurrence (see fig. 12).

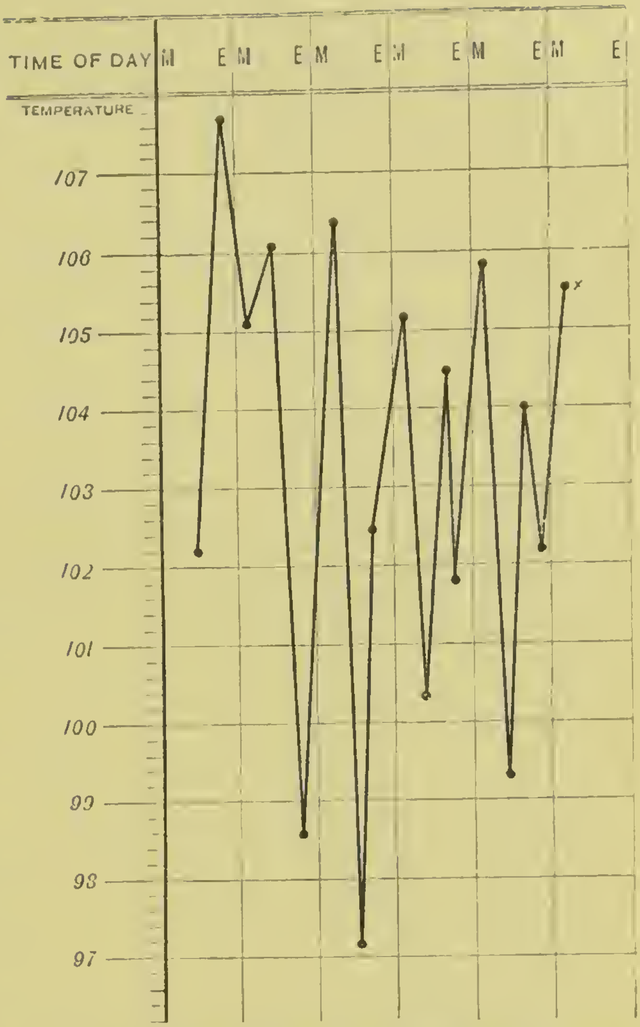

FIG. 12.—*Temperature chart in a case of rapid Pyæmia.* (*After Wunderlich.*)

On the third day the temperature was in the morning 106·4° F.; at mid-day 97·3° F.; and in the evening 102·5° F.

The intermittent type of fever is characteristic of:—

(1.) Those specific fevers in which the fever poison undergoes repeated developments in the system.—In relapsing fever there are usually two and sometimes three developments; in 'intermittent fever' the number of developments is indefinite, and unless the disease be arrested by therapeutic measures, an enormous number of relapses or separate attacks of fever may occur; the attacks of fever are periodic.

(2.) Suppuration, pyæmia, the presence of pent-up pus.—Each attack of fever probably corresponds to the absorption into the blood of some poisonous material produced at the seat of suppuration or other localised lesion. The attacks of fever are usually non-periodic (see fig. 12).

Under the intermittent type must also be included those extraordinary cases of so called elephantine temperature (see figs. 28 and 29), which are occasionally met with in hysterical females.

Mixed forms of fever, in which the temperature is partly continuous and partly intermittent, are frequently met with (see fig. 14). In phthisis and many other sub-acute and chronic affections in which this form of temperature curve is observed, there is usually a localised inflammatory condition which accounts for the continued fever, the marked remissions or intermissions being usually indicative of suppuration, and due to the absorption into the system of some poisonous material.

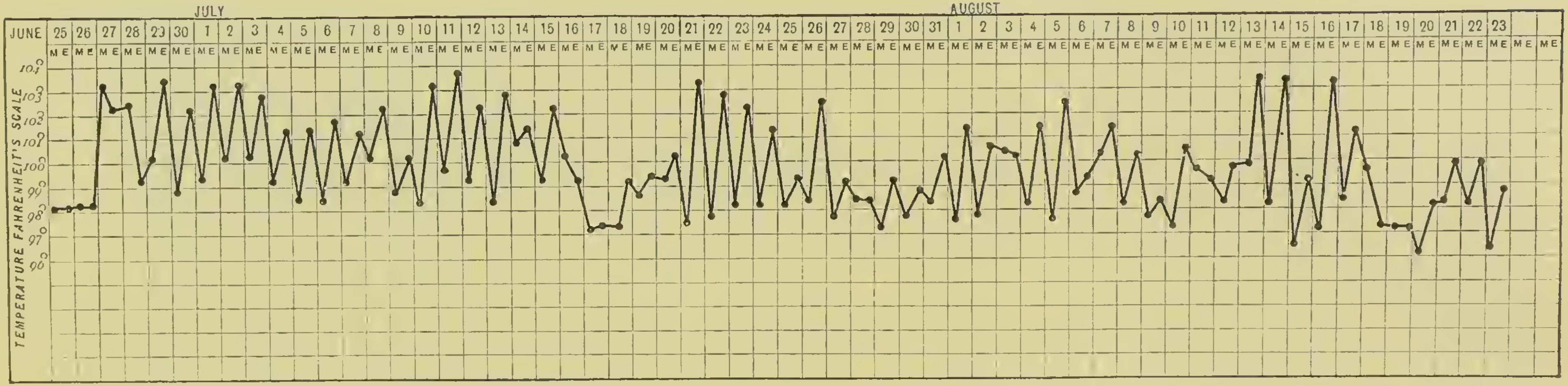

FIG. 13.—*Chart showing the course of the temperature in a case of Hydatid of the Liver which had suppurated.*

W. O . æt 31, a sailor, was admitted to the Newcastle-on-Tyne Infirmary, under my care, on 20th May 1875.

On June 25th the sac was punctured with the aspirator, and 40 ounces of slightly purulent fluid withdrawn ; *on June 27th* there was a severe rigor, and one drachm of jaborandi was administered ; *on June 28th* the jaborandi was repeated ; *on June 30th* the cyst was again punctured with the aspirator, and 39 ounces of thick pus withdrawn ; *on July 9th*, 40 ounces of pus were withdrawn by the aspirator; *on July 16th* the cyst was laid freely open under antiseptic precautions, and a drainage tube inserted ; *on June 27th* a portion of the cyst-wall, measuring 2 × 1½ inches came away ; *on June 29th* another small portion of the cyst-wall was discharged ; *on August 18th* a very large portion of cyst-wall came away ; *after August 23d* the temperature was normal

The striking effect which the evacuation of pus and the discharge of portions of the cyst-wall had on the temperature is seen by reference to the chart.

A full report of the case will be found in the *Edinburgh Medical Journal* for December 1875.

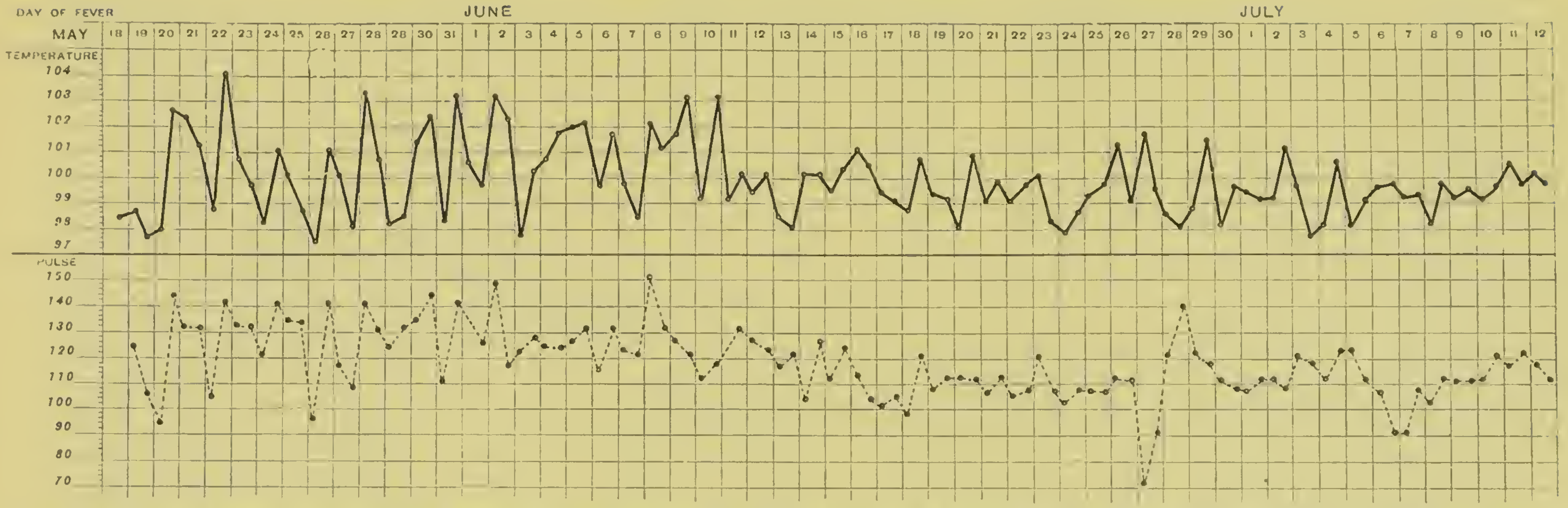

FIG. 14.—*Chart showing the course of the temperature and pulse in a case of Tubercular Meningitis, in which there was a practical recovery from the meningeal inflammation, but in which death resulted from secondary hydrocephalus.*

The temperature is of the 'mixed type,' *i.e.* partly continuous partly intermittent.

THE COURSE OF THE TEMPERATURE IN FEBRILE DISEASES.

The duration and character of the three periods (development, height, and decline) must be observed.

Stage of increase (*Initial* or *pyrogenetic* period).

In some cases the initial period is short and the rise in the temperature rapid (see figs. 8, 11); in others, the development is slow and the rise in temperature gradual (see fig. 7).

According to Wunderlich the following affections should be included in these two groups respectively:—

A. *Short initial period and rapid rise:*—All short fevers, febriculæ, fevers following surgical operations, disorders of digestion in children, variolous affections (small pox), scarlatina, croupous pneumonia, the individual attacks of fever in intermittent fever, relapsing fever, pyæmia, nervous fever.—(To these I would add cases of hysterical (functional) pyrexia, and many cases of fever due to injuries or lesions of the brain and spinal cord. *B. B.*)

B. *Prolonged initial period and insidious development:*— Acute rheumatism, pleurisy, pericarditis, periostitis, typhlitis, phthisis, numerous atypical affections, especially those in which the fever depends upon the gradually increasing severity of the local lesion.

Stage of full development (Height of the fever, fastigium).—The duration of the fastigium varies considerably in different diseases, and is sometimes of great diagnostic value.

In the following table the duration of the fastigium in some of the chief febrile affections is given after Wunderlich. (*Medical Thermometry*, page 261).

(1.) *Very short*,	Measles.
(2.) 5—6 *days*,	Bronchitis.
	Influenza.
	Cynanche.
	Parotitis.
	Catarrhal pneumonia.
	Wandering erysipelas.
	The suppurating fever of small pox.
	Peritonitis.
	The reaction fever of cholera.
(3.) 2—2½ *Weeks*,	Typhoid.
(4.) *A considerable time*,	Pleurisy.
	Trichinosis.
	Suppuration.
	Cerebro-spinal meningitis.
	Syphilis.

The degree of the fever during the fastigium.—Speaking generally, the average height of the temperature is of more importance than the absolute height on any single occasion, for an isolated elevation or fall may be due to some accidental circumstance. The absolute height may, however, be of real value; if, for example, in a case of continued fever the temperature during the fastigium never reaches 103° F.—I of course exclude cases in which special measures, such as cold bathing, have been taken to check the rise in temperature,—we may exclude typhoid. Again, if in a case of fever with sudden onset, the temperature reaches in the course of a few hours 107° or 108° F., and *remains high*,[1] we may almost certainly diagnose 'relapsing fever,' and may give a favourable prognosis. Again, if in the course of acute rheumatism the temperature becomes hyper-pyretic (107° F. and upwards), the prognosis is most unfavourable.

In the following table the average height of the fastigium in some of the chief febrile diseases is given after Wunderlich. (*Medical Thermometry*, page 248.)

	Degrees Fahr.
Typhoid, according to the severity of the case, . . .	102·2 —104·36
Typhus, ,, ,, . . .	102·56—104·9
Small Pox, ,, ,, . . .	102·2 —104
Measels, ,, ,, . . .	104 (often lower)
Croupous pneumonia, ,, ,, . . .	102·56—104
Meninsgiti of the convexity, ,, . . .	104 or more
Acute articular rheumatism without complications, according to the severity of the case, ...	101·3—103·1
Acute influenza, according to the severity of the case, .	101·3—102·56
Facial erysipelas, ,, ,, .	103·1—104
Parenchymatous tonsilitis, ,, ,, .	103·1 (about)

Speaking generally, the higher the average temperature during the fastigium, the more severe the case.

The character of the temperature curve during the fastigium.—When the fastigium is of brief duration the curve is of course a sharp one (see fig. 11, page 76). Where the fastigium is more prolonged the temperature either remains *steady* (though in consequence of the diurnal variations previously referred to, see page 76, it never remains continuously at the same height,) or *irregular*, owing to considerable variations.

The following diseases are, according to Wunderlich, characterised by a steady and unsteady fastigium respectively:—

A. *Steady fastigium:*—Typhus, scarlatina, croupous pneumonia, the prodromal stage of pneumonia and its allies, acute severe secondary pneumonia, facial erysipelas before it begins to spread, parenchymatous tonsilitis, meningitis of the convexity, severe febrile diseases, diseases with a short initial stage of rigors.

B. *Unsteady fastigium:*—Typhoid, especially at the commencement of convalescence, suppurating stage of smallpox, measles, catarrhal affections, acute articular rheumatism, basilar meningitis, acute tuberculosis, pleurisy, pericarditis, acute and chronic suppuration, pyæmia, phthisis, trichinosis.

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[1] In hysterical fever the temperature may rapidly run up to a very high point, but it does not remain high; in some organic lesions of the brain (*e.g.* meningitis) the temperature sometimes rises very rapidly and remains high, but in such cases prominent nervous symptoms always precede the rapid rise in temperature, and the diagnosis and prognosis can hardly be a matter of doubt.

After the fastigium has lasted for a longer or a shorter period—the exact duration varying with the nature of the disease and the severity of the special case under consideration—the patient either recovers or dies. In the former case (recovery) the temperature falls and the period of defervescence occurs; in the latter (death) the temperature in some cases rises, while in others it falls before death ('pro-agonistic' rise and fall respectively). See figs. 15, 16, 17, 25, 26, and 39.

The stage of defervescence or decline.—The fall of temperature may be rapid when the defervescence is said to be *by crisis;* or gradual—defervescence *by lysis.*

Defervescence by crisis (see figs. 18 and 19) occurs in cases in which

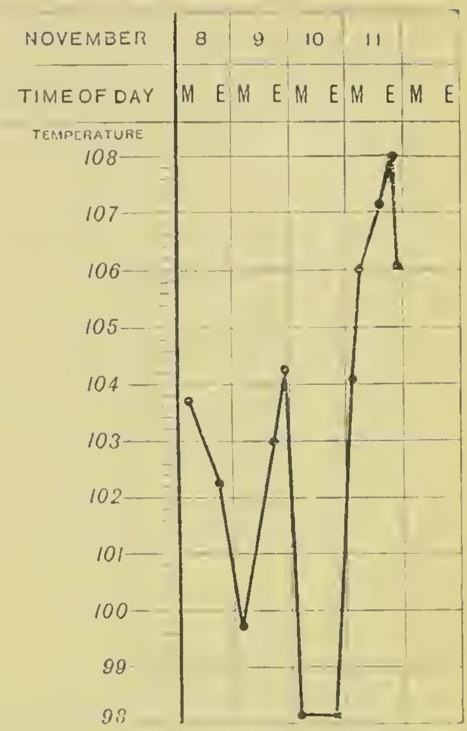

FIG. 15.—*Pro-agonistic rise of temperature in Ulcerative Endocarditis with commencing cerebral meningitis. For a report of the case see* The International Journal of the Medical Sciences, *July 1886.*

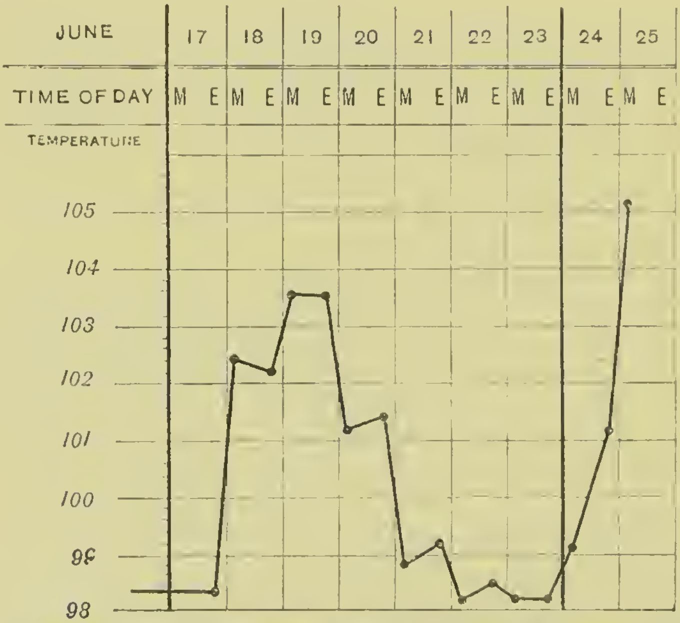

FIG. 16.—*Pro agonistic rise of temperature in Pernicious Anæmia.* (*For a report of the case see* The Edinburgh Medical Journal, *November 1877.*)

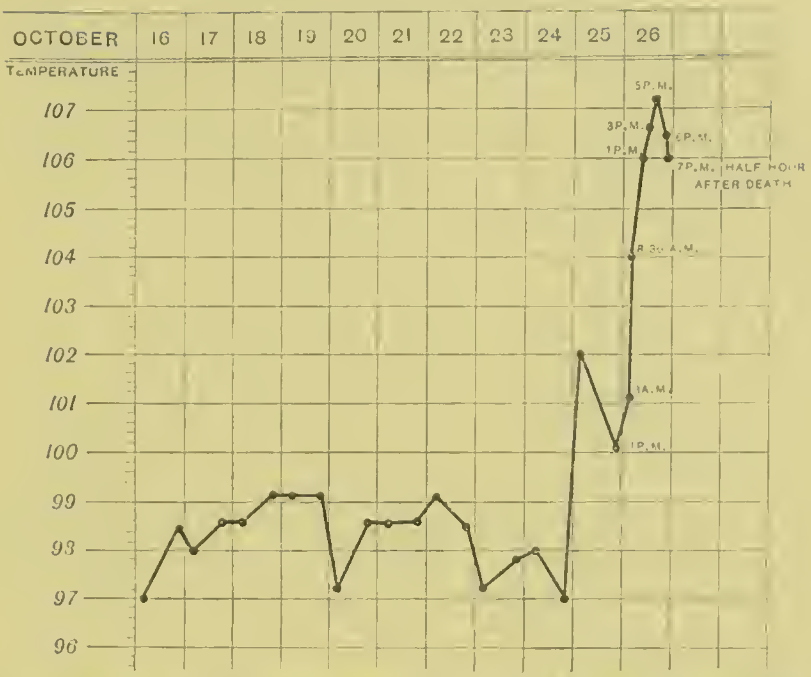

FIG. 17.—*Pro-agonistic rise of temperature in a case of Meningeal Cerebral Hæmorrhage, due to the rupture of an aneurism of the left common carotid artery. (For a report of the case see* The Edinburgh Medical Journal, *August 1886.)*

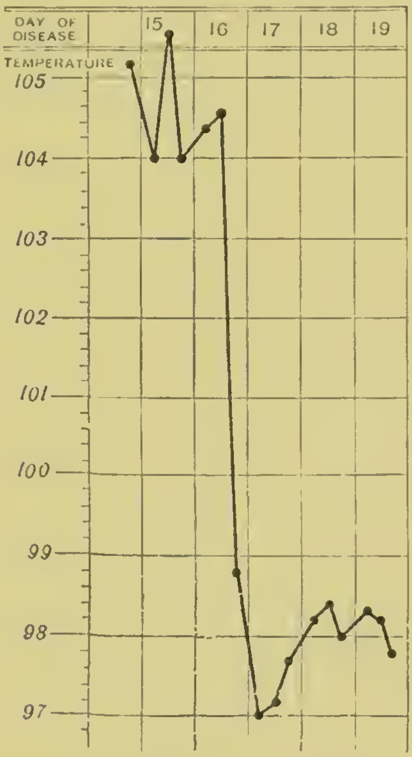

FIG. 18.

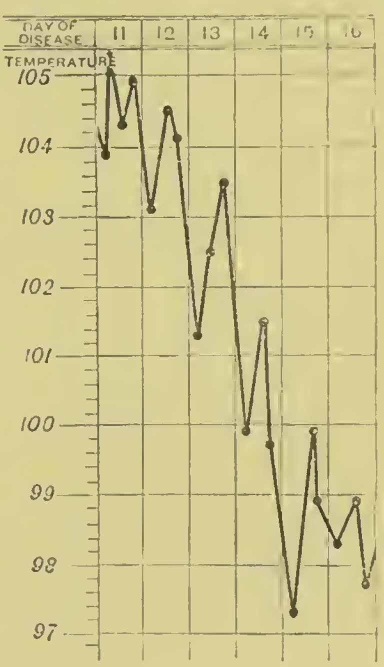

FIG. 19.

FIG. 18.—*Deferrescence by crisis in Relapsing Fever—a portion of the chart shown in fig. 8.*

FIG. 19.—*Deferrescence in Typhus Fever—a portion of the chart shown in fig. 7.*

the initial rise was rapid, as in relapsing and intermittent fevers; it is the natural mode of decline in those febrile affections in which the morbid process ceases with the termination of the fastigium, in which, in fact, as in typhus, no definite localised lesion remains.

In relapsing fever and intermittent fever each paroxysm should, as has been previously pointed out, be regarded as a separate and distinct fever; the morbid process which gives rise to the febrile paroxysm (but not of the disease as a whole) comes to an end at the termination of the hot stage, and a rapid fall in temperature (defervescence by crisis) then occurs.

Deferrescence by lysis (see figs. 20 and 21) occurs chiefly

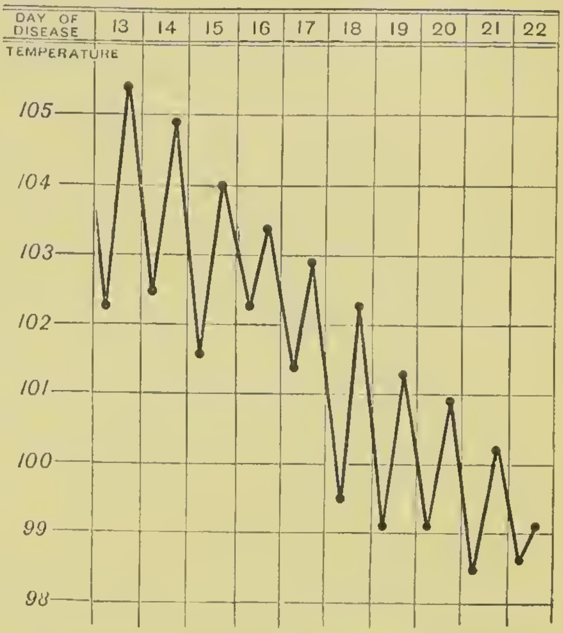

Fig. 20.—*Deferrescence by lysis in Typhoid Fever—a portion of the chart shown in fig. 6.*

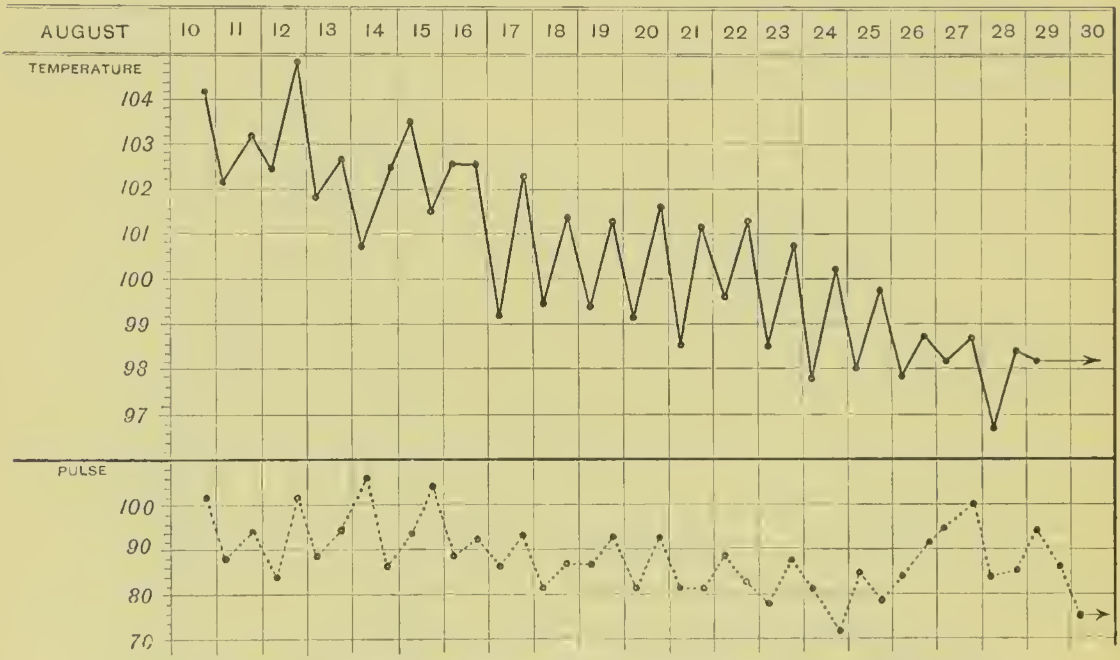

Fig. 21.—*Chart showing deferrescence by lysis in a case of Typhoid Fever.*

H. W., a pitman, æt. 19, admitted to the Newcastle-on-Tyne Infirmary under my care with the characteristic symptoms of mild typhoid. Under the administration of salicylate of soda, the case progressed most favourably, the course of the temperature and pulse being shown in the chart.

in those fevers in which the morbid process does not end with the termination of the fastigium, but in which, as in typhoid, a localised lesion remains.

Fevers which usually end by crisis may end by lysis when resolution is imperfect (as in some cases of pneumonia), or when some complication (such as a glandular abscess in the neck in scarlet fever) occurs.

Defervescence by lysis is not uncommon in very severe and prolonged cases of fever, even when the defervescence of the disease is usually by crisis. In defervescence by lysis the fall may extend over several days; in some cases it is steady and gradual, in others interrupted by considerable variations which often assume a remittent type (*'remittent lysis'*).

Defervescence by crisis and lysis are, according to Wunderlich, characteristic of the following affections. (*Medical Thermometry, page* 271.)

A. *Defervescence by crisis:*—Febrile disorders in which there is a rapid rise: all fevers with a short fastigium; relapsing fever; intermittent fever; croupous pneumonia; typhus; febricula; facial erysipelas after a relapse.

B. *Defervescence by steady lysis:*—Scarlatina; some cases of typhus; pneumonia; acute rheumatism.

C. *Defervescence by remitting lysis:*—Diseases in which a suppurating lesion remains; typhoid; suppurating varioloid; severe forms of catarrhal disease; scarlatina with suppurating glands.

The temperature during convalescence.—The return to health cannot be said to be complete until the temperature returns to and remains at the normal level. After defervescence by crisis the temperature often remains for some days slightly below the normal. During convalescence the temperature equilibrium is very unstable; slight errors in diet or other trivial accidental circumstances, which in health produce no temperature disturbance, may, during convalescence, cause a marked temporary rise, and so give rise to the suspicion of a relapse or the onset of some complication. In cases of this description it is not always possible to determine straight off what is the exact cause of the rise in temperature; the observer must, under such circumstances, be content to wait and watch the case for some hours, or even days, before its exact significance can be determined.

THE CLINICAL PHENOMENA ASSOCIATED WITH AN ATTACK OF FEVER.

Definite clinical phenomena accompany the development, height, and defervescence. They are briefly as follows:—

The clinical phenomena associated with the period of development.—The exact character of the symptoms varies with the nature of the rise whether *rapid* or *gradual.*

(1) When the temperature rises rapidly, as it does for instance in the cold stage of ague, the attack is ushered in by a rigor. In some

cases, the rigor is the first indication of ill health; in others, the patient has been feeling out of sorts (listless, tired, unfit for bodily or mental exertion, with perhaps slight headache, aching pains in the limbs and back, loss of appetite, etc.), for some hours or days previously. With the onset of the rigor a feeling of chilliness is usually first felt down the back or in the extremities; the sensation of coldness gradually increases and extends over the whole body; the features become pinched; the skin pale and shrivelled ('goose-skin,' or '*cutis anserina,*' as it is technically termed); the lips and nails blue; the teeth chatter; a convulsive tremor of the muscles causes a trembling of the whole body; the voice is feeble and husky. During the attack, the pulse is small, the vessels being contracted; the surface temperature is usually lowered, but the internal temperature above the normal, being sometimes as much as 104° or 105° F. (see fig. 22). The symptoms of the rigor

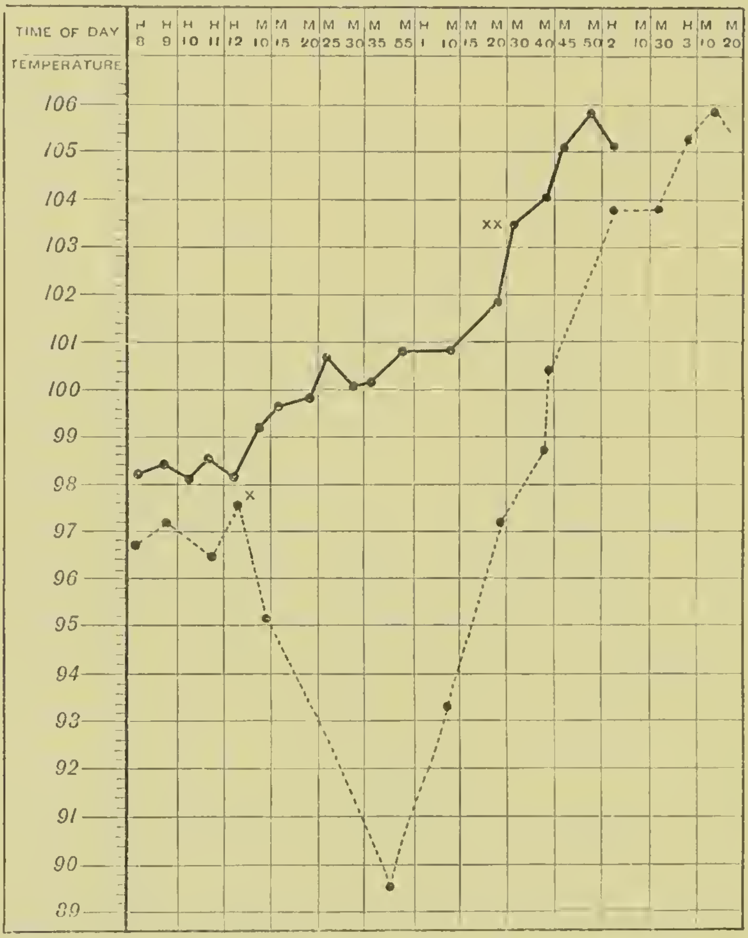

FIG. 22.—*Chart showing the course of the axillary and cutaneous (surface) temperatures during the rigor (cold stage) of Intermittent Fever. (After Redard.)*

× Marks the commencement of the rigor at 12 A.M.; × × indicates the end of the rigor at 1.30 P.M.; the continuous line indicates the axillary, and the dotted line the cutaneous (surface) temperature. At 12.40 P.M. the axillary temperature was 100·5° Farh., while the surface temperature was 89·6° Fah.

are probably due to the energetic action of the fever poison upon the vaso-motor and heat-producing centres; the loss of heat from the surface of the body being, as has been previously explained (see page 69), much diminished, while the heat production is at the same time increased. In young children a rapid rise in temperature is usually attended with muscular twitchings, and sometimes with violent epileptic convulsions.

(2) When the rise in temperature is gradual, the attack commences with a feeling of general malaise, disinclination for exertion either of body or mind, failure of appetite, myalgic pains in the back and limbs, frontal headache, disturbed sleep, etc. There is seldom a definite rigor, but a feeling of chilliness ('cold creeps') down the back is often experienced. These symptoms become more and more marked, and the temperature slowly and gradually rises until the period of full development of the fever is attained. In cases of this description, the action of the poison upon the vaso-motor and heat producing centres is more gradual and less energetic.

The clinical phenomena associated with the full development of the fever.—As the cold stage comes to an end, the feeling of coldness disappears and the headache,[1] the aching pains in the back and limbs usually subside.[2] A sensation of heat is now experienced, and the patient endeavours to cool himself by throwing off the bed-clothes. The vessels of the skin dilate, the face becomes flushed, and the skin feels hot, and is, as a rule, dry;[3] thirst is usually a prominent symptom; the patient is generally restless and unable to sleep. The frequency of the pulse is, in most cases, increased;[4] during the earlier stages of the fastigium the pulse is full and bounding;[5] if the fever should last for any length of time the arterial tension becomes much diminished, and the pulse becomes small, weak, dicrotic and sometimes irregular. The

Exceptions to some of the general statements in the text.

[1] Should the headache continue, meningitis or other localised brain lesion should be suspected. In relapsing fever the headache sometimes continues during the fastigium without any cerebral complication.

[2] In relapsing fever, the pains in the back and limbs may continue throughout the fastigium and during the period of convalescence.

[3] Profuse sweating occurs in rheumatic fever; in some cases of typhoid the skin is moist during the earlier periods of the fastigium; in relapsing fever there may be profuse sweating.

[4] In the earlier stages of typhoid the pulse frequency is not always increased; it may even be less than normal. In the later stages of basilar meningitis (*i.e.* during the period of effusion) the pulse is usually slow.

[5] In acute peritonitis the pulse is small and wiry, probably in consequence of stimulation of the vaso-motor centre in the medulla, and the resulting reflex contraction of the blood-vessels.

tongue is furred, usually dry,[1] and often fissured or cracked; the bowels are as a rule constipated,[2] and the appetite completely lost.[3] The patient looses weight, the muscles more especially emaciating. The urine is diminished in quantity, high coloured, and contains an excess of urea and uric acid;[4] its chlorides are diminished; it not unfrequently contains albumen. Should the fever continue for any length of time, the blood becomes over-charged with effete matters (urea and its derivates) which poison the nerve centres; 'wandering,' at first perhaps only present at night, or active delirium are observed; and a 'typhoid condition' established. The tongue becomes dry, brown, and contracted, it may resemble a piece of roasted leather; the teeth become covered with sordes; the pulse frequency is still further increased, and the dicrotism more prominent; delirium, stupor, 'subsultus tendinum,' 'picking the bed-clothes,' 'coma vigil,' or profound coma, may be observed.

During the fastigium, the temperature reaches its highest, the heat-production and heat-loss are both, as has been previously explained (page 69) very greatly increased; while the rashes and other characteristic lesions of the eruptive fevers become fully developed. Bronchial catarrh, which is liable to be mistaken by the inexperienced observer for the primary disease, is often present.

The clinical phenomena associated with the period of defervescence.—A very sudden fall of temperature and pulse, such as is seen in defervescence by crisis (see figs. 8 and 23), is often attended with marked collapse, which may cause considerable alarm. (In relapsing fever the temperature has been known to fall from 106° to 92° F., and the pulse from 140 to 52 within a few hours.) Critical collapse is, however, seldom if ever fatal; under appropriate treatment (the external application of heat and the internal administration of warm drinks and stimulants, beef-tea and hot brandy and water being the best) the patient speedily rallies, and generally falls into a quiet and refreshing sleep, from which he wakes obviously improved, the tongue beginning to be moist, the eye brighter, the intelligence greater, the pulse quiet, etc. Profuse sweating very often attends defervescence by crisis; it is very marked in intermittent and relapsing fevers. In some cases, there is critical diarrhœa; in others, a copious discharge of urates; occasionally dyspnœa or transient delirium.

Exceptions to some of the general statements in the text.

[1] In the earlier stages of typhoid the tongue is often moist.

[2] In typhoid, diarrhœa is usually a prominent symptom.

[3] In some cases of relapsing fever the appetite continues unimpaired, or may even be voracious throughout the fastigium.

[4] The amount of carbonic acid discharged from the lungs is also much increased.

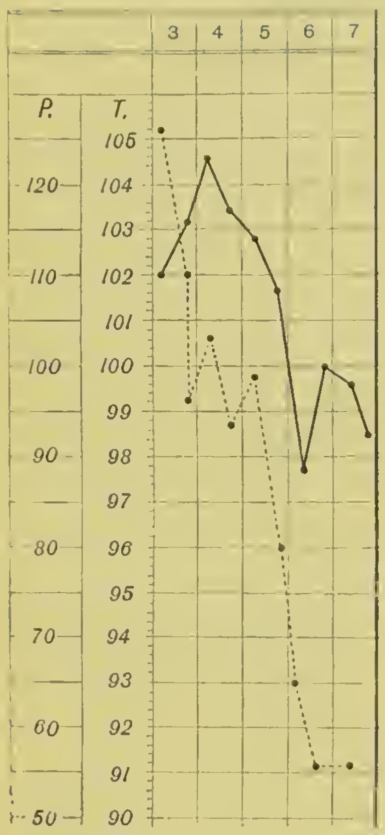

FIG. 23.

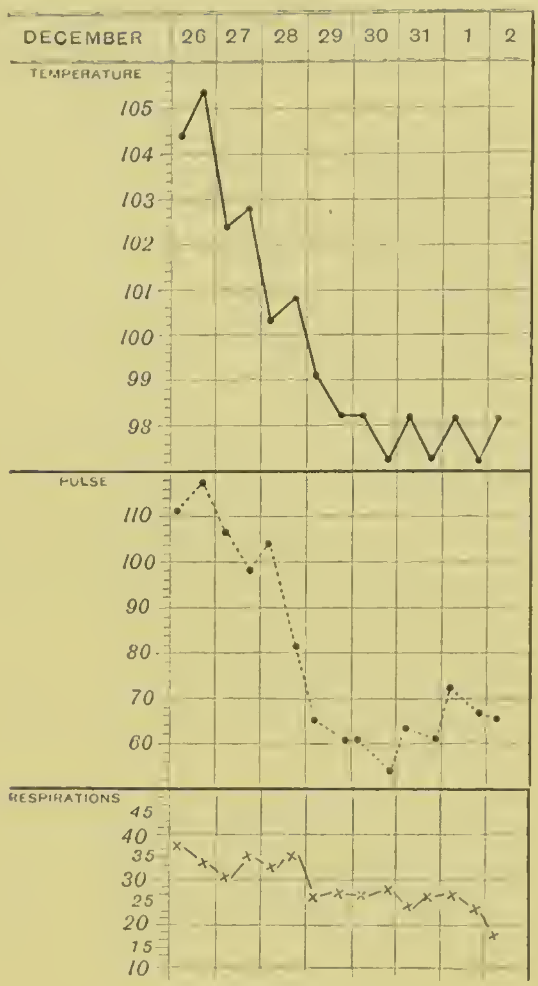

FIG. 24.

FIG. 23.—*Chart showing the fall in temperature (continuous line) and pulse (dotted line) in the collapse of deferrescence of Scarlet Fever. (After Redard.)*

FIG. 24.—*Chart showing the fall in temperature, pulse, and respirations in the deferrescence of Acute Croupous Pneumonia of moderate severity.*

G. F., æt. 19, a labourer, admitted to the Newcastle-on-Tyne Infirmary under my care, on 25th December 1875.

On December 21st, the patient got cold when stripped; *on December 22d*, he had a rigor, and felt pains under left breast; when examined, *on December 26th*, dulness and tubular breathing were present over the lower half of the left lung; *on January 18th* the patient was discharged well.

The collapse and rapid fall in temperature of critical defervescence must not be confounded with the rapid fall of temperature and collapse which, in some cases, occur just before death. In *pro-lethal* or *pro-agonistic* collapse, as it is termed, the frequency of the pulse and respirations usually increases rather than diminishes (see figs. 25 and 26); while the pulse becomes more dicrotic, smaller, more thready and irregular, or altogether imperceptible.

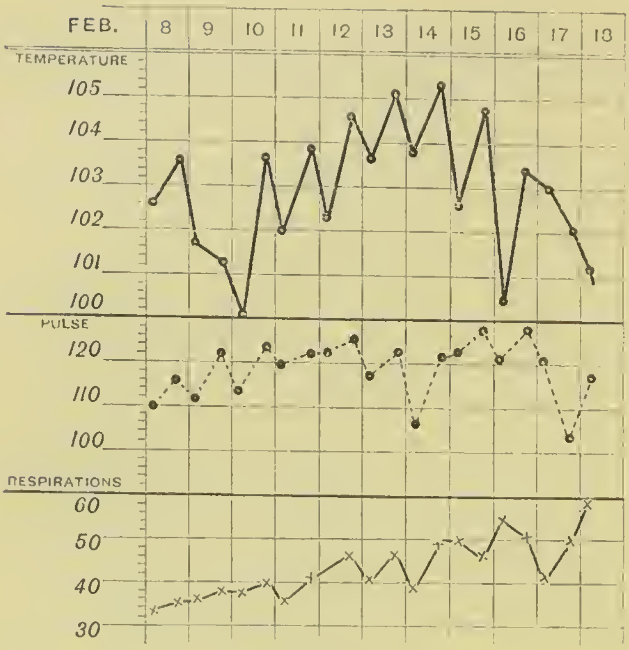

FIG. 25.

FIG. 25.—*Chart showing the course of the temperature, pulse, and respirations in a case of Acute Tuberculosis.*

P. H., a labourer, æt. 47, admitted to the Newcastle-on-Tyne Infirmary, under my care, on 24th December 1874, complaining of loss of flesh, cough, and shortness of breath of three weeks' duration. The clinical history was typical of acute tuberculosis, the diagnosis being verified *post-mortem.* Death took place at 10 A.M. on February 18th. At 9 A.M. the temperature was falling, while the pulse and respirations were rising as seen in the chart.

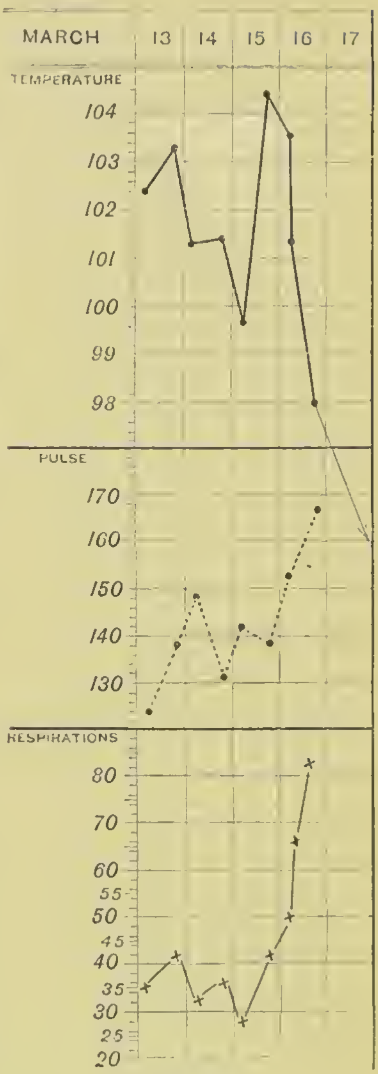

FIG. 26.

FIG. 26.—*Chart showing a pro-agonistic fall of temperature, and rise of pulse and respirations in a case of Acute Catarrhal Phthisis and Purulent Pericarditis.*

J. M., æt. 20, admitted to the Newcastle-on-Tyne Infirmary, under my care, on 25th February 1874. He had been ill for three months; both lungs were extensively diseased. After death the kidneys were found to be slightly waxy.

When the temperature falls slowly (defervescence by lysis) the return to health is more gradual; the pulse-frequency lessens day by day, the tongue slowly cleans, the delirium and other urgent nervous symptoms gradually abate, the appetite is slowly regained, etc.

In 'remitting lysis,' where marked ups and downs in the daily temperature curve occur, sweatings and collapse are sometimes met with. Suppurative temperatures (which are characterised by sudden variations, each rise and fall being, as we have seen, a distinct attack of fever) are usually associated clinically with rigors, sweatings, or attacks of collapse.

During the period of defervescence the heat-loss is, as has been previously pointed out, greatly increased, while the heat-production may be (a) increased, (b) normal, or (c) diminished.

The clinical phenomena associated with the period of convalescence.—During convalescence the temperature is, as has been previously stated, very mobile, and liable to be deranged by trivial causes, such as slight indiscretions in diet. The patient is anæmic and debilitated; he is apt to be giddy and faint on exertion, and should be cautioned against suddenly rising from the recumbent position, or putting any undue strain upon the heart, lest fainting or fatal syncope should occur. The digestive organs are feeble, and careful attention to diet is necessary, more especially in typhoid, in which a local lesion of the intestine still remains unhealed. In some diseases, special precautions are necessary during convalescence: after scarlet fever, for example, the patient must be carefully protected against cold and everything which is likely to produce congestion of the kidneys. In scarlet fever, small pox, and whooping cough, special precautions are necessary during the period of convalescence to prevent the risk of infection.

THE DIFFERENTIAL DIAGNOSIS OF FEVER.

In every case in which there is pyrexia or fever, the physician must endeavour to determine its exact cause, for increased body temperature, like dropsy, cough, vomiting, etc., is a symptom not a disease. In some cases it is impossible to come to a positive conclusion (*i.e.* to make a diagnosis) at the first visit. Under such circumstances the physician (having noted the height of the temperature, the general condition of the patient, and having made a careful examination of all the systems and organs) must be content to wait for the development of symptoms and physical signs which will enable him to come to a definite conclusion as to the nature of the case. Should there be any reason to suppose that the fever is due to an infectious or contagious disease, the patient must be isolated until the exact nature of the condition is apparent, and every precaution taken to prevent the spread of the disease should the suspicion of contagion prove to be correct.

In trying to form an opinion as to the nature of a doubtful case of fever, it should be remembered that an elevation of temperature, as shown by the thermometer, may be due to the following conditions:—

1. A localised inflammation.
2. The presence in the body of the poison of a specific, contagious, malarious, or septic fever, and the derangement of the system which results therefrom.

3. Diseases—both functional and organic—of the central nervous system and the consequent disturbance of the mechanism concerned in the production and regulation of the body heat.
4. Imposture.

The points to which attention should be chiefly directed in order to make a diagnosis are:—

(1.) The character of the symptoms and their mode of development.

(2.) The nature of the physical signs.

(3.) The exact date and mode of commencement of the attack.

(4.) The temperature; its height; mode of development, and course.

(5.) A history of exposure to infection, and the duration of the supposed period of incubation; the occurrence of other cases of disease in the same family, house, or neighbourhood; the prevalence of an epidemic.

(6.) The history of a previous attack of the infectious or contagious disease from which it is supposed the patient may be suffering.

(7.) The age of the patient.

FEVER DUE TO A LOCAL INFLAMMATION.

When the fever is due to a local inflammation, the most important points to which attention should be directed are:—

The presence of localised pain, and of symptoms indicative of functional derangement of some particular organ or part.—At the commencement of an attack of pleurisy, for example, a sharp, shooting pain in the side, which catches the breath, is usually a prominent symptom; there is generally some cough; and the breathing is shallow and quick. It must not, however, be supposed that all inflammations are attended with pain. The liver, lung, and even the nerve centres (brain and spinal cord), may be extensively inflamed without any pain being experienced. Hence the necessity in every case in which the cause of the pyrexia is obscure, of making a careful physical examination of all the internal viscera, more especially of the thoracic organs and of the liver.[1] It is chiefly when the inflammation is confined to the substance (interior) of the organ that pain is absent. When the capsule, to which the sensory nerves are abundantly distributed, is affected (either directly implicated by the inflammatory process, or suddenly put upon the stretch by internal pressure), pain is usually a very prominent symptom.

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[1] Murchison states that in many cases of inflammation of the substance of the liver, there is no fever.

The presence of abnormal physical signs at the seat of the disease.—The exact nature of the physical signs which characterise inflammation of the different internal organs will be afterwards described.

The character of the temperature.—In the majority of the acute inflammations the fever is of the *continuous* type; a marked exception occurs in those inflammatory affections which are attended with suppuration (see figs. 12 and 13, pages 77 and 78).

Note.—In seeking to discover the cause of the fever, the observer must be careful not to mistake some incidental complication (the bronchitis for example, which so frequently accompanies typhoid fever) for the primary disease. Whenever there is any doubt, the physician should ask himself whether the supposed cause is sufficient to account for the amount and character of the fever which is present.

FEVER DUE TO THE SPECIFIC CONTAGIOUS DISEASES.

To clearly understand the points to which attention must be directed when the fever is supposed to be due to the presence of the specific contagious diseases, it is necessary to be acquainted with the leading characteristics of those affections.

The specific contagious diseases (such as typhus, typhoid, scarlet fever), owe their origin to the introduction into the body of specific, particulate, organic poisons, which, so far as is known, do not arise *de novo*, but are always derived from some pre-existing case of the same disease. In some cases (as in scarlet fever and typhus) the poison is given off from the skin or lungs, and communicated through the air, by direct contact, or by means of 'fomites.' In others, as in typhoid, the poison is given off from the bowel. The specific contagious diseases always 'breed true,' in other words, the same poison always produces the same disease (typhoid only produces typhoid, typhus only produces typhus, and so on); they have a definite duration and characteristic course. The poison, after its introduction into the system, remains latent for a certain period. The period at which the symptoms manifest themselves after exposure to contagion is of importance for the purposes of diagnosis, for the duration of the *latent period* or the *period of incubation* varies with the nature of the disease; probably also with the dose of the poison, and the channel through which it is introduced into the body. After the latent period has elapsed, the disease manifests itself; usually lasts for a definite time; and then ends either in recovery or death. In many of the true specific, contagious diseases, characteristic skin eruptions or rashes, which appear at definite periods of the disease, and on definite parts of the body, are observed; these rashes are consequently of great importance in diagnosis. In many, there are characteristic local lesions, such for example as the sore throat of scarlet fever, the ulceration of the intestine of typhoid. One attack usually protects against a second; as a rule, therefore, the true specific contagious disease only occurs once in a life-time. Some of them are more common at one period of life than at another, the exanthemata, for example, are usually contracted during childhood; scarlet fever is rarely met with in infants under twelve months old; typhus is more common in adults than in children, etc.

In cases, therefore, in which the fever is supposed to be due to the presence of a true, specific, contagious disease, attention should be directed to the following points:—

The presence of a rash; its exact character and distribution; the date of its appearance.—The physician must remember that a rash is not always present, even in those diseases which are usually characterised by it. *Scarlatina sine eruptione*, for instance, is not very uncommon. The rash, too, may have disappeared before the case comes under observation. In calculating the time at which a rash ought to appear, due allowance must be made for variations in the latent period which seem to occur, and for the difficulty that there is in many cases, in fixing the exact date of exposure to infection, and the exact date at which the attack commenced. Care must be taken not to confound the eruption due to skin diseases or to drugs (both of which may of course be complicated with pyrexia) with the rashes of fevers—a point to which attention will be directed more in detail when the differential diagnosis of the diseases of the skin is treated of.

The presence of characteristic symptoms and physical signs (other than the skin eruptions just referred to), such, for example, as the sore throat and 'strawberry' tongue of scarlet fever; the diarrhœa, slight fulness of the abdomen, tenderness and gurgling in the right iliac fossa, and the enlarged spleen of typhoid, etc.

The temperature; its height; mode of development and course. The different specific contagious diseases have, as has been previously stated, distinct, and for the most part characteristic temperature charts: compare, for example, the mode of development and whole course of the temperature in typhoid, typhus, and relapsing fever respectively. (See figs. 7, 8 and 9, pages 73 and 74.) The behaviour of the temperature when the rash appears is a point of some importance. In some diseases, smallpox for instance, there is a decided fall in temperature when the rash appears.

A history of contagion; of exposure to an obvious source of infection; the date of such exposure, and the length of time which has elapsed before the onset of the disease, the appearance of the rash, and other *characteristic symptoms; the presence of other cases of illness in the same family or house; the prevalence of an epidemic in the neighbourhood, or in the part of the country in which the patient has been living.*

When the exact source of infection is not clear, the drainage of the house in which the patient has been living, the source and character of the water and milk supply, and any other possible sources of infection must be investigated.

The history of a previous attack.—Although one attack protects, as a rule, against a second, this is by no means always the case, and some people possess the unfortunate idiosyncracy of again and again contracting the same specific contagious disease (typhus, for example), whenever they are exposed to the contagion.

FEVER DUE TO SEPTIC CONDITIONS.

The chief points to which attention should be directed in the case of a supposed 'septic fever' are:—

The presence of a wound or other obvious source of infection.—The septic fevers (such as pyæmia and septicæmia) owe their origin to poisons which probably do arise, *de novo*, as the result of decomposition—very commonly decomposition in a wound. Occasionally the source of infection is internal, such, for example, as an ulceration of the intestine, or an abscess in the lung.

The temperature curve, and the constitutional symptoms.—In *pyæmia* the temperature is characterised by extraordinary fluctuations—irregular ups and downs—and by rigors and profuse sweatings. In *septicæmia* the fever is rather of the continuous type; it is often, though by no means always, high; in some cases it is sub-normal; the general symptoms are those of blood poisoning and depression.

FEVER DUE TO MALARIA.

The chief points to which attention should be directed when the fever is supposed to be due to malaria are:—

The periodicity of the attacks of fever; the character of the temperature curve (sudden rise, short fastigium, and rapid fall); and the presence of a distinct cold, hot and sweating stage. In some cases the paroxysm of fever occurs every day *(quotidian)*; in others, every other day *(tertian)*; in others again, every fourth day *(quartan)*. (See fig. 27.) Mixed types, such as double tertian, double quartan, etc., are also met with. As a rule, the attacks of fever occur at the same time of day; in some cases, more especially at the commencement of the disease, the usual time of occurrence is anticipated, instead, for example, of occurring at 12 o'clock each day, a quotidian ague may occur on Monday,

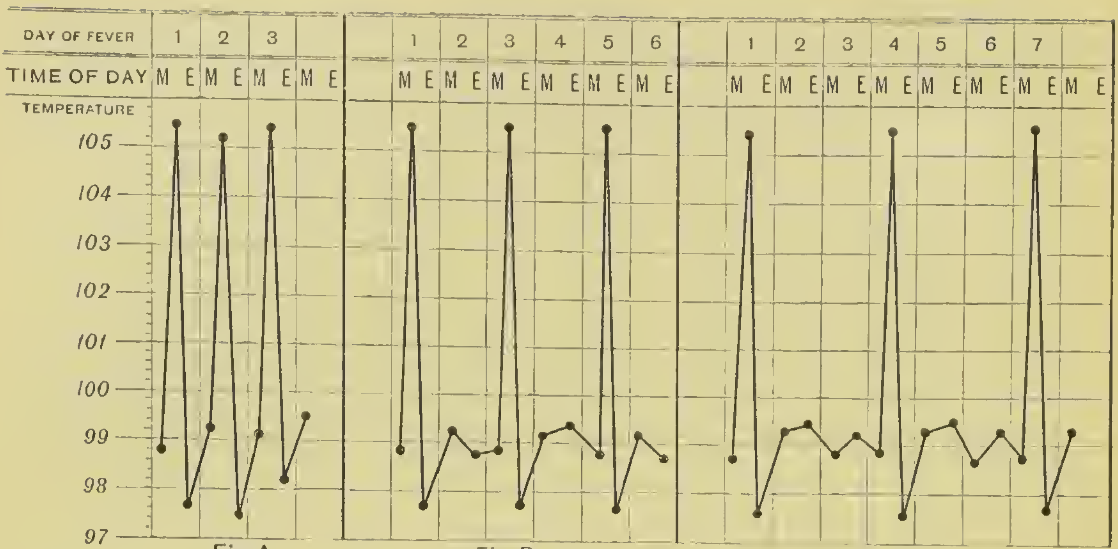

Fig A. Fig B. Fig C.

FIG. 27.—*Diagram showing the course of the temperature in the three great types of Intermittent Fever (Ague). Fig. A, quotidian; Fig. B, tertian; Fig. C, quartan.*

say at 12; on Tuesday at 11.45; on Wednesday at 11.30, and so on; in cases of this description the fever is said to be '*waxing*.' In other cases, the period of occurrence is postponed (Monday at 12, Tuesday at 12.15, Wednesday at 12.30, and so on); the fever is then said to be '*waning*.'

The duration of the affection.—Malarial fevers, when untreated, may last for a very long time, they have, in short, no fixed and definite duration; even when quinine and other appropriate remedies have been vigorously administered, the fever poison may remain lurking in the system (possibly in the spleen or in the marrow of the bones), and a paroxysm of fever may come on some months or even years after the disease has apparently subsided. Anything which produces depression, such, for example, as exposure to cold, a violent injury, or profound mental anxiety, seems in some cases to reproduce an attack.

A history of exposure to malaria.—Ague is comparatively rarely met with in Scotland, though it is by no means uncommon in the midlands and fen districts of England. In the majority of cases of well-marked ague which we see in this country, the disease has been contracted abroad. The occupation and residence of the patient (whether he has lived in a malarious district), should always, therefore, be carefully investigated.

The condition of the patient between the paroxysms; the state of the spleen; the condition of the blood.—After the paroxysm passes off, the patient is, as a rule, free from fever, indeed the temperature may for a time be subnormal; there is perhaps some lassitude and fatigue, but otherwise the patient may feel well. After repeated attacks the patient is apt to become anæmic and cachectic. During the febrile attacks the spleen increases in size, and after repeated attacks a chronic enlargement of the organ (which has been termed 'ague-cake') may be established. During an attack of intermittent fever, the red blood corpuscles undergo a marked diminution (destruction); the white globules are usually in excess; free pigment granules can often be seen in the blood; and an organism, the *bacillus malariæ*, has also been demonstrated.

FEVER DUE TO LESIONS OF THE NERVE CENTRES.

Fever may result either from organic disease or functional derangement of the nerve centres; and in many cases it is probably due to direct derangement of the nervous mechanism concerned in the production and regulation of the body heat. In the case of organic lesions, such, for example, as myelitis, meningitis, and cerebral hæmorrhage, the associated symptoms and signs, and the evidences of organic disease are usually so definite and distinct that the physician, who is acquainted with the diseases of the nervous system, can seldom have any difficulty in coming to a conclusion as to the nature of the case. The chief difficulties in diagnosis arise in those cases in which distinct evidence of organic disease of the nervous system is wanting—in hysteria, and other functional derangements, for example. In cases of this description the physician must be on his guard against deception, and must (1) satisfy himself that the increased temperature is genuine. He must see that no external source of heat, such as a hot bottle, poultice, etc., is in contact with the patient; and must take care that the elevation of the mercury is not the result of friction, for it has been suggested that the extraordinary elevations of temperature, which have been observed in some hysterical cases, may possibly have been produced by the patient rubbing the arm against the bulb of the thermometer. The physician should himself hold the thermometer *in situ* while the observation is being made, and should take the temperature not only in the axilla but also in the mouth and rectum. The general condition of the patient at the time of the observation and the condition of the part (such as the axilla) with which the mercury is in contact, should be carefully tested.

(2) Having satisfied himself that the elevation of temperature is genuine, and that there is no obvious cause of pyrexia present, he may, by the method of exclusion, be able to conclude that the pyrexia is due to derangement of the nervous system.

(3) For the next step in the diagnosis, he must rely upon his knowledge of nervous disease. Provided that there is no distinct evidence of organic disease, and granting that there are symptoms of functional derangement (such as hysterical symptoms), he may feel compelled to conclude that the pyrexia is due to a temporary and functional disturbance of the nervous mechanism concerned in the production and regulation of the animal heat. For my own part I see no reason why such functional and temporary derangements may not occur. Hysterical paralysis, hysterical contracture, hysterical anæsthesia, hysterical dyspnœa, hysterical palpitation, are all well recognised conditions, which, like hysterical pyrexia, are, I think, probably due to arrested blood supply, a spasmodic arterial contraction, shutting off the nutrient material from certain of the cerebral nerve centres connected with the motor, sensory, respiratory, cardiac, heat-producing or heat-regulating mechanisms respectively. It must, however, be stated that cases in which a diagnosis of hysterical pyrexia is warranted, are rare. Cases of the kind, to which Dr Donkin has applied the term 'paradoxical temperature,' are of the greatest interest, and require much more careful study than has as yet been given to them. They are calculated, I think, to throw some light upon the position and structure of the nervous mechanism concerned in the production and regulation of animal heat.

The extraordinary character of the temperature curve—the remarkable height to which the temperature may rise, and the sudden variations which occur (see figs. 28 and 29)—together with the absence of grave symptoms, in many cases show conclusively the nature of the case.

Summary of the points to which attention should be directed in the differential diagnosis of a case of pyrexia.

1. Ascertain from the patient or the patient's friends the leading symptoms, their mode of development, and the exact date of the commencement of the attack. By this means we get a clew to the nature of the case, and pass on to steps 2, 3, 4, or 5, as that clew may suggest.

2. If you suspect the case to be one of the true specific contagious diseases, look for a rash and for symptoms and signs indicative of the characteristic local lesion; see whether the height of the temperature and the period of incubation are in keeping with the supposed nature of the case; ascertain if the patient has been exposed to infection; if there are similar cases in the house or neighbourhood; if he has previously suffered from the suspected disease, etc.

Hysterical Pyrexia: Axillary temperature.

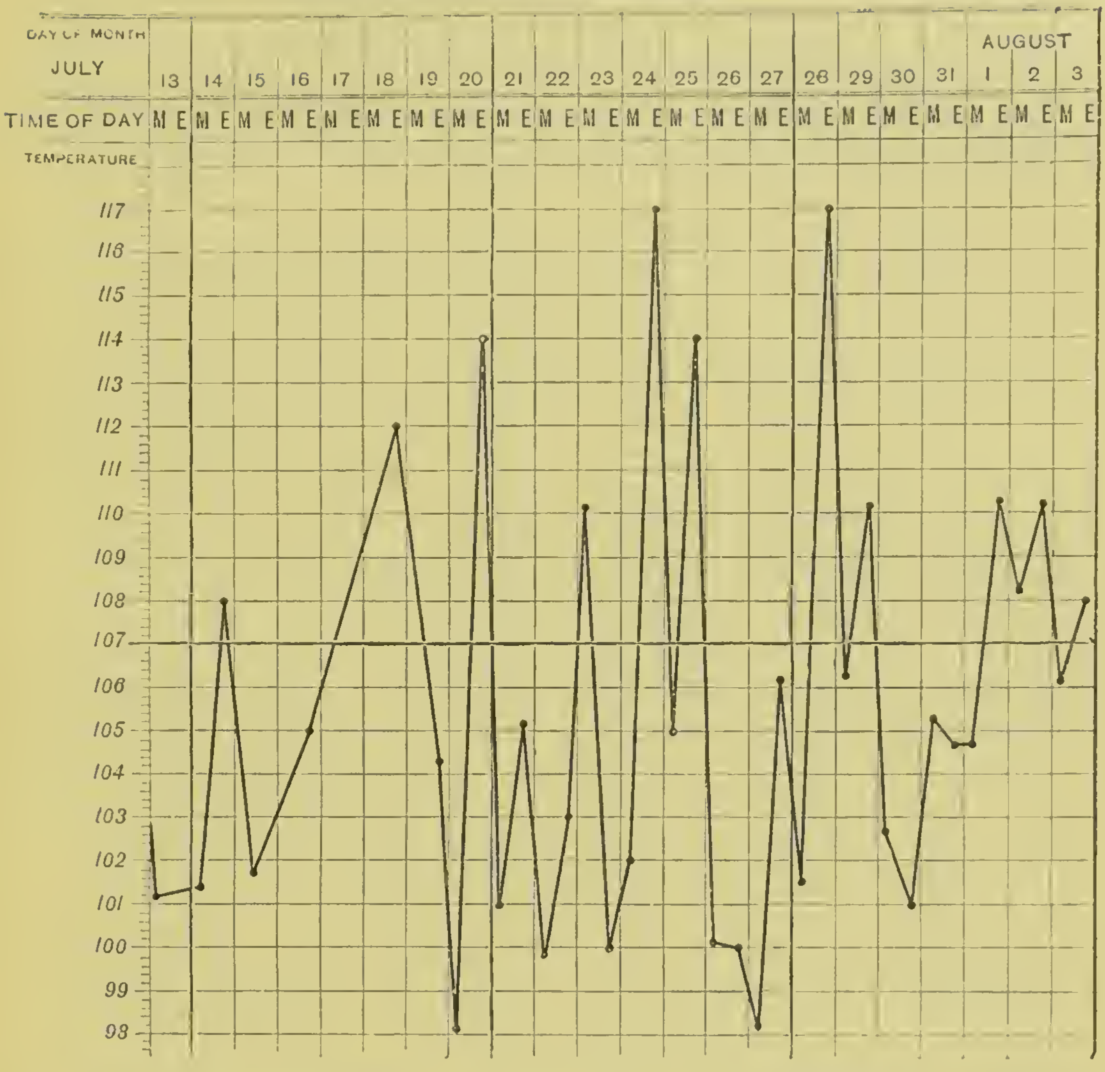

FIG. 28.—*Chart showing the axillary temperature in Professor G. H. Philipson's case of Hysteria.*

The patient, a domestic servant, æt. 23, was admitted to the Newcastle-on-Tyne Infirmary on July 4th, 1879, under the care of Professor G. H. Philipson, suffering from well-marked hysteria, intercostal neuralgia, and amenorrhœa,—there was marked cutaneous hyperæsthesia; the skin was usually hot and dry, but during the night, and at times during the day, there were profuse, sour smelling acid perspirations; the pulse and respirations were normal throughout the whole course of the case; the temperature presented the extraordinary elevations shown in the charts (fig. 28 show the temperature in the axilla; fig. 29 the temperature in the mouth).

Three thermometers of greater range than usual were employed; they were always placed in position, one in the mouth and one in each axilla, and removed either by the clinical clerk or the senior house surgeon; during the time that the thermometers were *in situ* a nurse was placed at the patient's bedside, and instructed to watch carefully for, and to prevent any movement of the patient's arms.

The elevations of temperature were usually of brief duration, and were not uniformly distributed over the body; on the 24th of July, for example, the temperature in the left axilla was 117° F., when that on the right axilla was 110° F., and that in the mouth 102° F.

For further particulars the reader is referred to the *Lancet*, 1880, vol. i. p. 641.

Hysteria Pyrexia: Temperature in mouth.

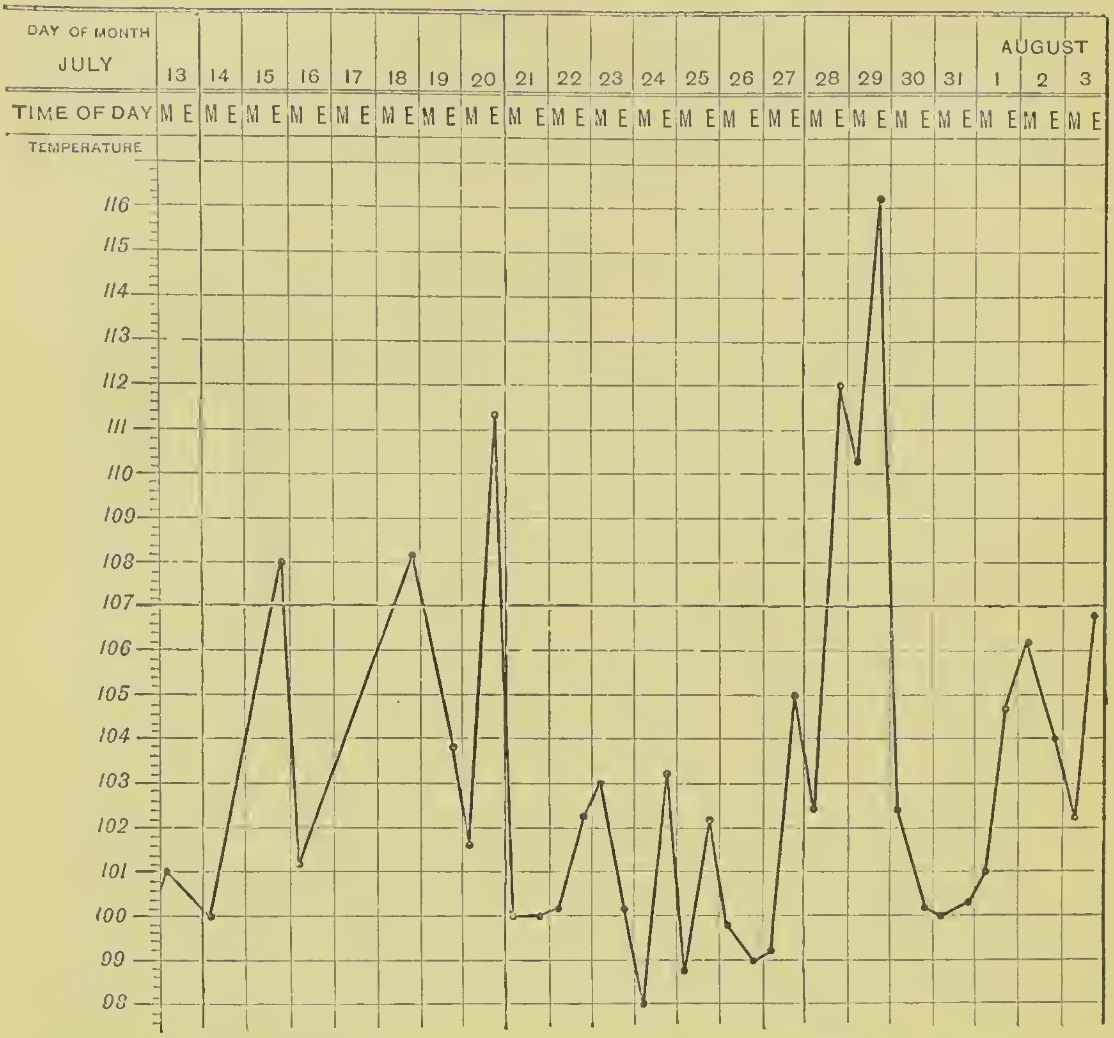

FIG. 29.—*Chart showing the temperature in the mouth in Professor G. H. Philipson's case of Hysteria.* (For description of case see fig. 28.)

3. If you suspect the presence of a local inflammation, make a careful physicial examination of the organ or part, and ascertain if there is any pain, or if there are any indications of functional derangement.

In obscure cases of pyrexia, the condition of all the viscera, but more especially of the lungs and liver must be carefully investigated.

4. If you suspect the fever to be of malarious origin, look to the temperature curve and the periodicity of the attacks; ascertain the duration of the disease; whether the patient has been exposed to malaria; and particularly investigate the condition of the blood and spleen.

5. If you suspect a septic fever, look for an external wound or injury, or other (internal) source of infection; and regard the temperature curve and the general symptoms.

6. In hyperpyretic temperatures without grave symptoms, suspect relapsing fever, hysterical fever, or malingering.

7. When you cannot make a diagnosis at the first visit, isolate the patient, and take precautions to prevent the spread of infection in case the pyrexia should be due to an infectious or contagious disease.

8. When you feel satisfied that the pyrexia is genuine, and that it is not due to a local inflammation, specific, contagious, malarial or septic disease, and when there are nervous symptoms present, you may conclude that the fever results from the nervous lesion.

9. The differential diagnosis of the exact nature and position of the nervous lesion, and whether it is functional or organic, can only be determined by a careful and detailed examination of the nervous system, and depends on considerations which it would be out of place to consider here.

DIMINUTION OF TEMPERATURE: ALGIDITY.

Diminution of the body heat as a whole, the temperature of the central as well as of the peripheral parts being lowered, may, for the purposes of description, be termed *general depression of temperature* or *general algidity.* It occurs both as an acute and chronic condition; the former (*acute* general depression or *acute* general algidity) being more common than the latter (*chronic* general depression of temperature or *chronic* general algidity).

General algidity must be carefully distinguished from the condition in which the temperature of the peripheral parts is lowered while that of the central or deeper parts remains normal or is elevated—a condition which may be termed *peripheral depression of temperature* or *peripheral algidity.* The distinction can only be made by observing the temperature of the rectum, and comparing it with that of the surface of the body.

Peripheral algidity, with a normal temperature of the central and deeper parts, is of common occurrence both in health and disease. It may result from exposing the surface of the body to external cold, and is readily produced in children in whom the temperature equilibrium is more unstable than in adults. Healthy persons exhibit great differences in their susceptibility to external variations in temperature. Those whose vaso-motor tone is low, bear both heat and cold badly; in them peripheral depressions of temperature are readily produced by exposure to external cold, the blood in the peripheral or surface circulation being driven into the central or deeper parts, a result which is not always unattended with danger, for should the arteries—say in the brain—be degenerated, the sudden increase of pressure to which their coats are exposed may lead to rupture and an attack of hæmorrhagic apoplexy. The sudden overfilling of the deeper vessels, which so frequently results in persons of low vaso-motor tone from exposure to cold, is, I believe, a common cause of headaches. The sudden over distention of the left ventricle, which may result from the action of cold on the peripheral parts is, without doubt, in some cases the immediate exciting cause of an attack of angina pectoris.

Peripheral depressions with a normal temperature of the central and deeper parts are very common in disease; while peripheral depression with central elevation, is of frequent occurrence in febrile disorders. During the stage of rigor, for example, the rectal temperature may be rising rapidly and very much above the normal, while the patient is shivering with cold, and the temperature of the peripheral parts subnormal (see fig. 30). In cholera, too, the surface temperature may be greatly depressed, while the central (rectal) temperature is normal or much above the normal. In some cases of sclerema neonatorum, remark-

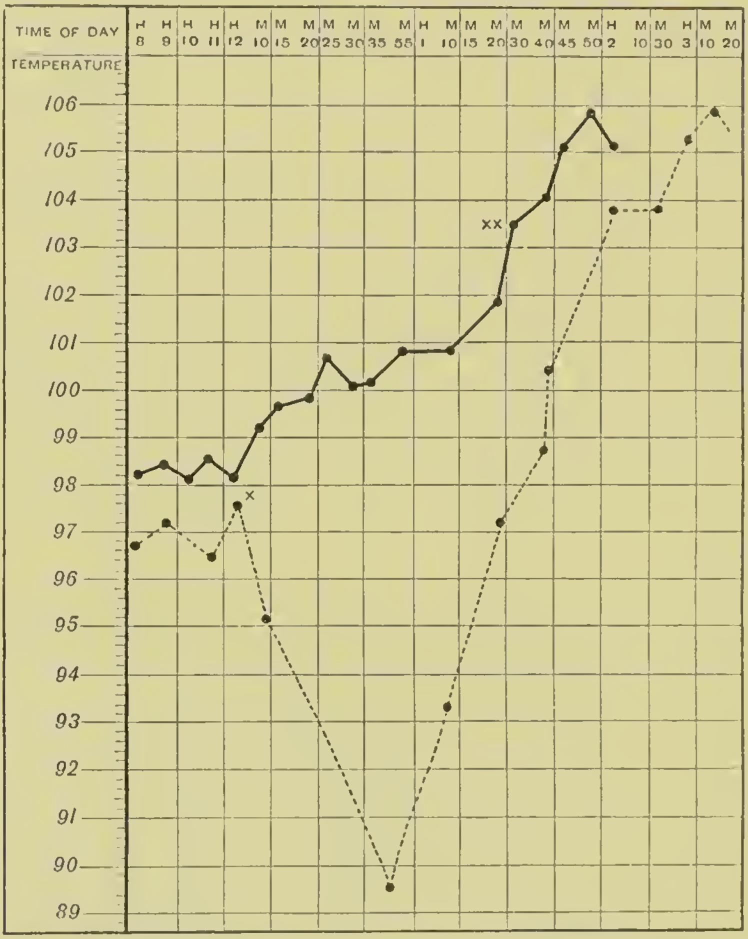

FIG. 30.—*Chart showing the course of the axillary and cutaneous (surface) temperatures during the rigor (cold stage) of Intermittent Fever. (After Redard.)*

× Marks the commencement of the rigor at 12 A.M.: × × indicates the end of the rigor at 1.30 P.M.; the continuous line indicates the axillary, and the dotted line the cutaneous (surface) temperature. At 12.40 P.M. the axillary temperature was 100·5, while the surface temperature was 89·6° Fah.

able differences have also been noted between the peripheral and central temperatures (see fig. 31). Many other examples of a similar kind might also be mentioned.

Acute general algidity.

A sudden depression of the body temperature as a whole, occurs in many different conditions, and may result from a variety of causes. The following are some of the chief:—

1. *Prolonged exposure to severe external cold.*—Professor Peter (quoted by Redard) has reported a case in which the temperature of a woman, who had been exposed to extreme cold, fell to 26° C.=78·5° Fah., and in which recovery nevertheless took place.

2. *Cold and alcohol.*—When the patient is in a state of alcoholic intoxication, cooling of the body by exposure to external cold is still more easily produced. Numerous cases have been reported in which the temperature under such circumstances fell to 78° F., or even below it.[1]

3. *Severe traumatic injuries.*—All conditions which produce profound shock and depression, such as fear, pain, hæmorrhage, laceration of nerves, lower the temperature. Hence algidity is very frequently seen after severe injuries, more especially those which are attended with profound collapse, such as perforating wounds of the thorax and abdomen, severe contusions and lacerations, severe burns, etc.

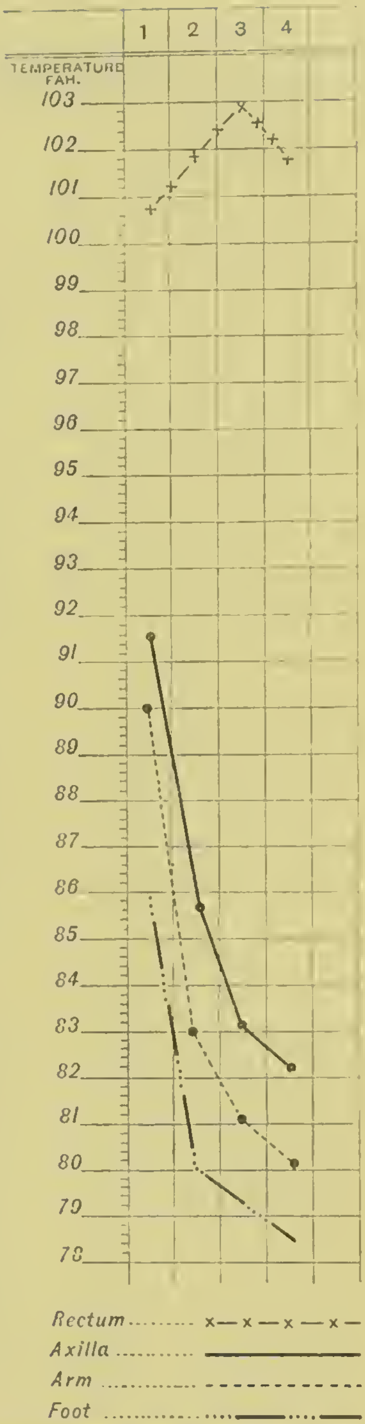

FIG. 31.—*Chart showing the temperature of the rectum, axilla, arm, and foot, in a case of Sclerema Neonatorum. (After Gassot.)*

On the third day on which the temperature was taken (the fourth day of the disease) the rectal temperature was 103° Fah., while the temperatures of the axilla, arm, and foot were 83°, 81°, and 79·5° Fah. respectively.

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[1] Magnan and Duguet, Nicolaysen, Reincke, Weilland, G. Glaser, have seen temperatures (centigrade) of 26° (cure) 24·7°, 32·7° (death), 28·4°, 26·6° (cure), and 30·4°, 24°, 26·7° (cure), in alcoholics exposed to cold.—*Redard's Traité de Thermométrie Médicale*, page 30.

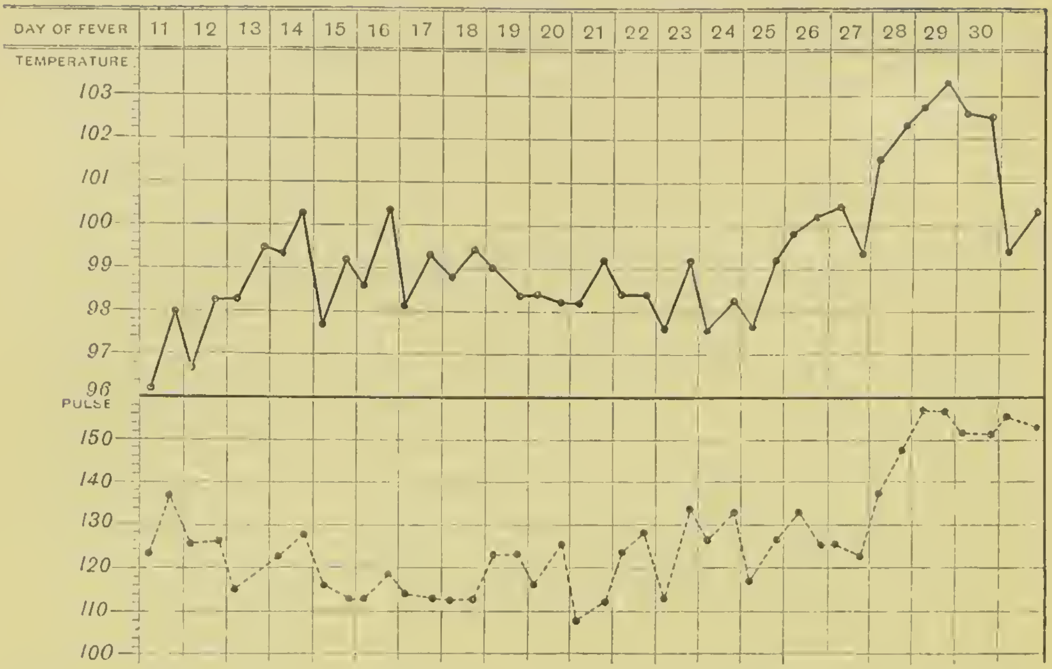

FIG 32.—*Chart showing the course of the temperature and pulse in a case of Chronic Obstruction of the Bowels, the result of a malignant stricture: the fatal termination was due to perforation and peritonitis.*

J. C., admitted to the Newcastle-on-Tyne Infirmary, under my care, on April 29th; died on May 31st, 1875.

On May 11th the temperature is seen to be sub-normal, while the pulse frequency is much increased.

4. *Rupture of internal organs* (such as the stomach or intestine); strangulation or obstruction of the intestines (see fig 32); the passage of renal or hepatic calculi; in short, all internal and spontaneous (as distinguished from external and traumatic) causes of collapse and shock may be attended with a general depression of temperature.

It must not, however, be supposed that the central temperature is depressed in all cases of collapse—cases, indeed, sometimes occur in which, with the symptoms of collapse, the temperature is elevated. In such cases the prognosis is always very grave, in fact the condition is, in most cases, indicative of impending death.

5. *Hæmorrhage.*—A sudden and profuse loss of blood is usually attended with a fall in temperature, which may be considerable in extent, more especially when the bleeding occurs in the course of a fever or other disease in which the temperature is above the normal (see fig. 33). The depression of temperature is, as a rule, of brief duration; should the patient survive, the mercury generally rises, after a few hours at the most, and often exceeds its previous standard of elevation (see fig. 39). A copious hæmorrhage occurring in a healthy person is,

TYPHOID FEVER WITH HÆMORRHAGE.

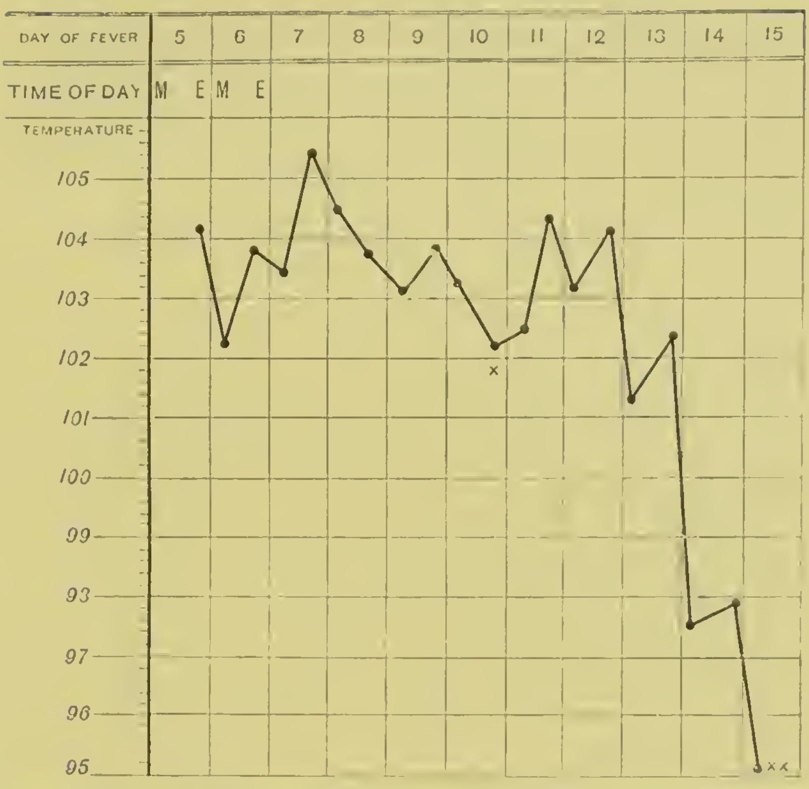

FIG. 33.—*Chart in a case of Typhoid Fever showing a marked fall in temperature the result of intestinal hæmorrhage.* (*After Redard.*)

× A slight fall after the administration of an antimonial draught.

× × Marked fall, the result of intestinal hæmorrhage. Death took place two hours after the last observation of the temperature.

according to Redard,[1] only attended with a slight temporary depression of the central temperature, followed by an elevation which may last from ten to twelve hours, but during the period that the temperature of the central parts is raised, that of the peripheral parts remains depressed.

6. *Diarrhœa and vomiting.*—Sudden and profuse diarrhœa, or copious vomiting, such as occurs in the summer cholera of children, is often attended with great depressions in the peripheral, and sometimes, too, with marked falls in the central temperature. The same result also occurs in true or Asiatic cholera, in which, however, the central temperature is often much elevated when the peripheral temperature is markedly depressed. Any profuse and sudden discharge (diarrhœa, vomiting, sweating) occurring in persons who are in a debilitated and cachectic condition, suffering from phthisis for example, may be attended with depression of temperature.

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[1] *Loc. cit.*, page 48.

7. *Severe injuries or lesions of the central nervous system.*—Sudden lesions which produce profound nervous shock, and more especially those which directly interfere with the nervous mechanism concerned in the production and regulation of animal heat, may be attended with marked depression of temperature. In cerebral hæmorrhage, Charcot, Bourneville and others, have shown that there is at the outset a very distinct fall in temperature, which is of real diagnostic and prognostic importance.

In the temperature curve of cerebral hæmorrhage three distinct periods may be recognised :—

(1) A period of depression which comes on immediately after the extravasation. Within a few (1—3) hours the temperature which has fallen 1 or 2 degrees centegrade, the average (minimum) point to which it falls being 36° C.=96 8° F., returns to the normal.

(2) A stationary period, during which slight variations (elevations or depressions above or below the normal standard) may occur.

(3.) A period of elevation, which usually sets in within three days from the commencement of the attack, and which is characterised by all the usual symptoms of fever; the extent of rise may be considerable, in severe and fatal cases the temperature may reach 40°, 41°, or even 42° C. These three periods are characteristic, and help to distinguish an apoplectic attack due to cerebral hæmorrhage from an apoplectic attack due to cerebral embolism, and from the apoplectiform attacks which so frequently occur in the course of general paralysis of the insane, cerebral tumours, multiple cerebro-spinal sclerosis, alcoholic intoxication, hysteria, and some other conditions.—*Redard's Thermometrie Medicale*, page 94, *et seq.*

8. *The onset of pericarditis in old people.*—This, according to Charcot, is often attended with a depression of temperature. In some cases, too, of peritonitis I have observed a slight depression of temperature at the commencement of the attack.

9. *Asphyxia.*—In poisoning by carbonic acid, and conditions of asphyxia the temperature falls below the normal.

10. *Uræmia; Acute yellow atrophy of the liver.*—The remarkable depressions of temperature which occur in uræmia, and the subnormal temperature which is met with in some cases of acute yellow atrophy of the liver, are probably due to the action of retained excrementious materials upon the heat generating nerve centres.

11. *Poisons.*—Alcohol, digitalis, quinine, morphia, antimony, chloroform, and many other drugs, when given in large doses, produce marked depressions of temperature.

In some cases, too, of septicæmia and scarlet fever, in which the symptoms progress with alarming rapidity, the temperature may not rise, but may remain normal, or even sink below the normal.

In some very rapid cases of scarlet fever, in which the patients died within eighteen or twenty-four hours after the onset of the attack, and in which the symptoms were chiefly those of collapse with vomiting, and in one case also diarrhœa, I have seen the temperature in the axilla, during the first few hours below the normal, the nerve centres appearing, as it were, to be paralysed by the intensity of the poison.

In those cases of septicæmia and gangrene, in which the temperature is subnormal, the depression is perhaps due to the action of a ptomaine rather than of a particulate, living, organic poison, upon the nerve centres.

12. *Febrile diseases.*—Collapse with algidity, which in some cases is

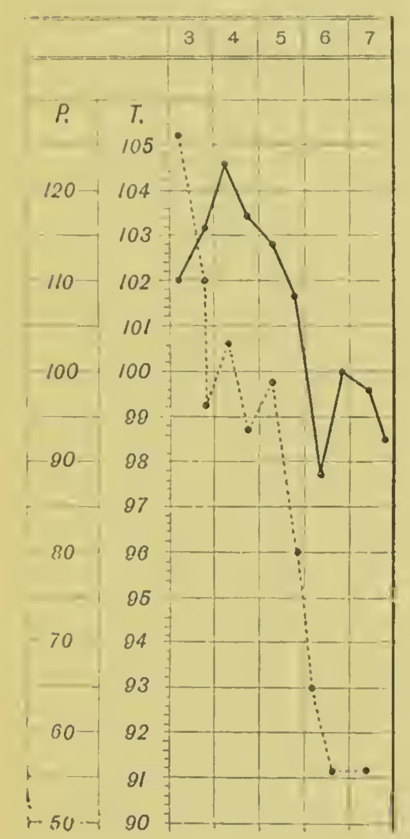

Fig. 34.

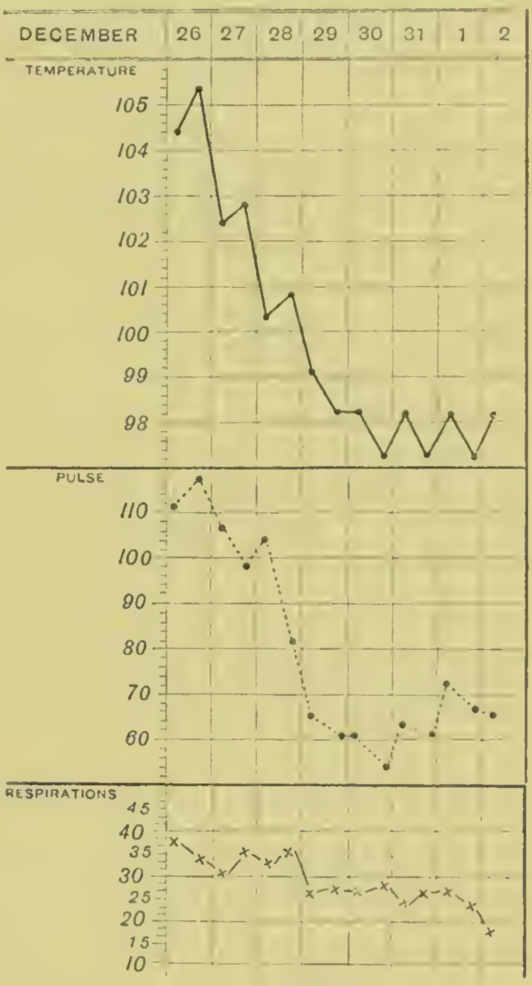

Fig. 35.

Fig. 34.—*Chart showing the fall in temperature (continuous line) and pulse (dotted line) in the collapse of defervescence of Scarlet Fever. (After Redard.)*

Fig. 35.—*Chart showing the fall in temperature, pulse, and respirations in the defervescence of Acute Croupous Pneumonia of moderate severity.*

G. F., æt. 19, a labourer, admitted to the Newcastle-on-Tyne Infirmary under my care, on 25th December 1875.

On December 21st, the patient got cold when stripped; *on December 22d* he had a rigor, and felt pains under left breast; when examined, *on December 26th*, dulness and tubular breathing were present over the lower half of the left lung; *on January 18th* the patient was discharged well.

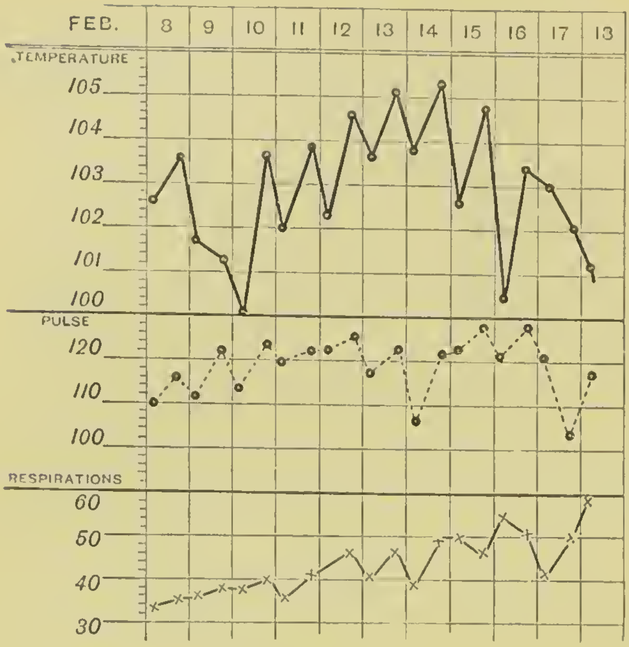

FIG. 36.

FIG. 36.—*Chart showing the course of the temperature, pulse, and respirations in a case of Acute Tuberculosis.*

P. H., a labourer, æt. 47, admitted to the Newcastle-on-Tyne Infirmary, under my care, on 24th December 1874, complaining of loss of flesh, cough, and shortness of breath of three weeks' duration. The clinical history was typical of acute tuberculosis, the diagnosis being verified *post-mortem*. Death took place at 10 A.M. on February 18th At 9 A.M. the temperature was falling, while the pulse and temperature were rising, as seen in the chart.

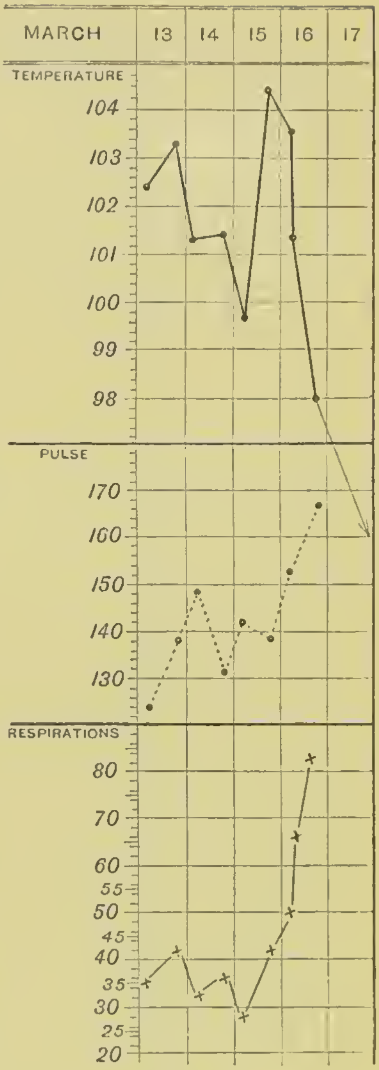

FIG. 37.

FIG. 37.—*Chart showing a pro-agonistic fall of temperature with a rise of pulse and respirations in a case of Acute Catarrhal Phthisis and Purulent Pericarditis.*

J. M., æt. 20, admitted into the Newcastle-on-Tyne Infirmary, under my care, on February 25th, 1874 He had been ill for three months, both lungs were extensively diseased. The kidneys were found after death to be slightly waxy.

general, in others peripheral only, may occur (*a*) at the commencement of a fever with the stage of rigor; (*b*) during the course of the fever, as the result of some accident or complication (severe hæmorrhage, copious diarrhœa, perforation of the intestine in typhoid for instance): and (*c*) at the terminal period of the attack, when it may be indicative of a remission, critical defervescence (recovery), or death (the pro-agonistic or pro-lethal fall of Wunderlich).

In critical defervescence, the symptoms of collapse are not, as a rule, severe; and the condition is still further distinguished from the fall which so frequently precedes death, by the fact that there is along with the fall in temperature, a diminution in the frequency of the pulse and respirations (see figs. 34 and 35). In pro-agonistic collapse, while the temperature may fall, the pulse increases in frequency, its force at the same time diminishes, it becomes thready, often irregular, and sometimes imperceptible; the respirations, too, increase rather than diminish in frequency (see figs. 36 and 37). Quite exceptionally the pulse frequency is diminished in the collapse which proceeds death. A very remarkable case of this description occurred in my hospital practice a few years ago (see fig. 38). The observation was made by a very careful clinical

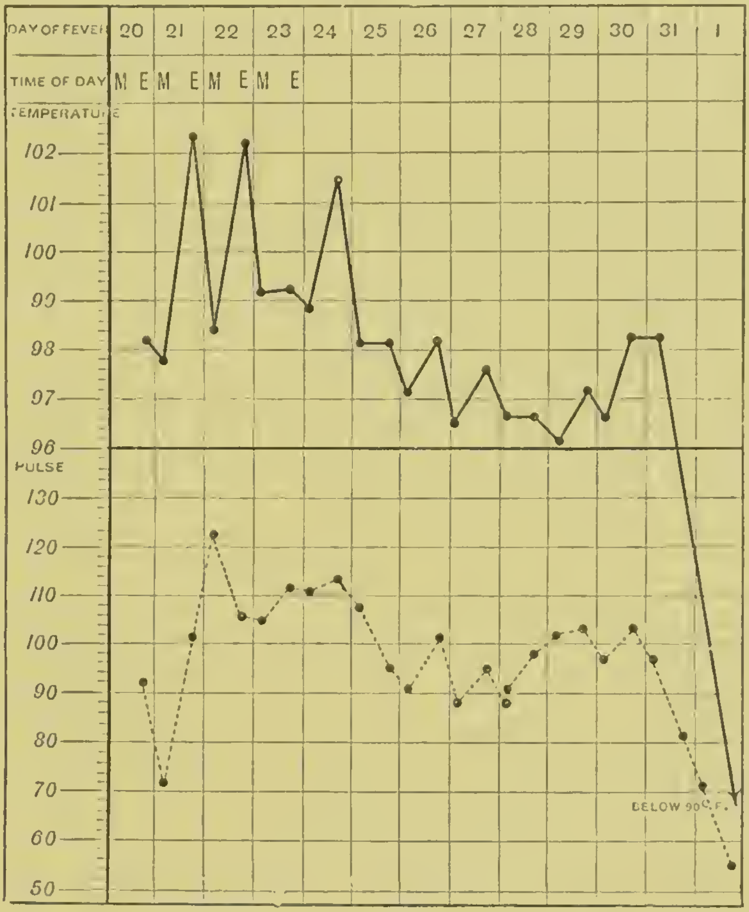

FIG. 38.—*Remarkable pro-agonistic fall of temperature and pulse in a case of Amyloid Degeneration.*

D. B., æt 24, admitted to the Newcastle-on-Tyne Infirmary, under my care, on 20th May, 1875, suffering from waxy disease of the kidneys, intestine, spleen, liver, etc. There was very profuse diarrhœa. On May 25th, the patient passed into a semi-comatose condition, which was probably the result, in part at least, of uræmia. For thirty hours before death (which took place on June 2d) he was completely unconscious. The temperature fell before death to below 90° F. (How much below 90° I cannot say, as the thermometer which was used was not registered below that point.) With the fall in temperature there was also a remarkable fall in the pulse frequency. The final observation, when the temperature was below 90° F. and the pulse 54°, was made by a clinical clerk on whom I could thoroughly rely. Whether the diminished frequency of the pulse was due to the fact that some of the heart beats were so weak as to be imperceptible at the wrist, I cannot say.

clerk. The question naturally occurs whether the cardiac contractions were actually diminished in frequency—whether in short, some of the cardiac contractions were not too feeble to reach the wrist and to be felt in the radial artery.

The extent of the temperature depression in cases of acute general algidity is, of course, very variable in different cases. Speaking generally, it may be said that the greater the fall, the more serious its significance but here, as has been previously insisted upon, the thermometer must not be taken as the only guide. In order to form a sound judgment, the physician must also take into account the cause of the temperature alteration, the character of the associated symptoms and physical signs, the conditions in which the fall occurs, and the constitutional peculiarities of the patient—in short, all the facts of the case.

The duration of the temperature depression also varies with the nature of the disease or injury, the severity of the lesion, and the constitutional peculiarities of each individual patient.

The course of the temperature after the depression passes off.—Provided that the patient does not die during the period of depression, the temperature rises after a period, which varies in different cases, but which is usually of brief duration, and attains to, or even exceeds, its previous standard of elevation (the height at which it stood before the depression occurred.) The rise which succeeds the depression may continue for a considerable time; in cerebral hæmorrhage, for instance, the primary fall is, after a stationary period, followed by a marked rise which usually lasts for some days, and which is associated with the presence of inflammatory changes round the clot (cerebritis); in phthisis, too, after a temperature fall the result of a copious hæmoptysis, the subsequent rise is in some cases of considerable duration (see fig. 39), and is pro-

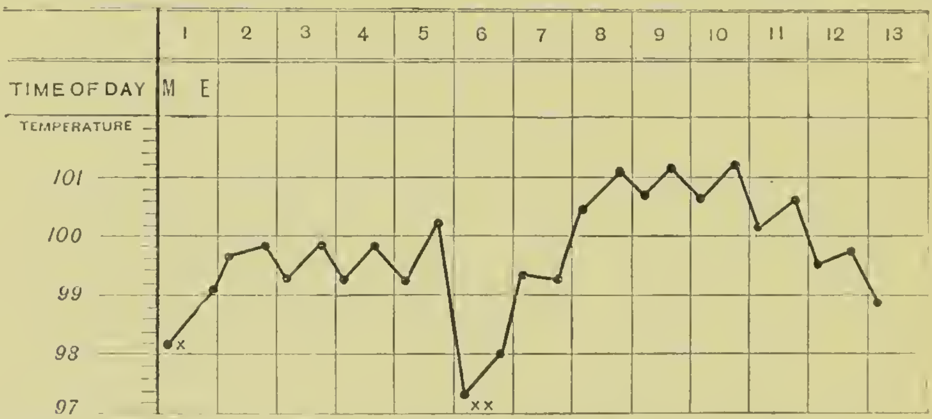

FIG. 39.—*Chart in a case of Chronic Tuberculosis (phthisis), showing the influence of hæmorrhage of the lungs on the temperature curve. (After Redard.)*

× First attack of hæmorrage followed by a rise.

× × Second hæmorrhage followed by a still greater rise, which continued for five days.

bably due in many to the inflammatory changes which the extravasated blood excites in the pulmonary tissues.

CHRONIC GENERAL DEPRESSION OF TEMPERATURE; CHRONIC GENERAL ALGIDITY.

The more permanent depressions of temperature which occur in the course of chronic diseases are, as a rule, small in degree. They are met with in a variety of affections, and may be due to many different causes, amongst which the following may be mentioned:—

1. *Inanition.*—In cancer of the stomach, the general temperature is often one or two degrees below the normal. The depression is probably due chiefly to inanition rather than to the pathological character of the lesion.

2. *Imperfect oxygenation of the blood.*—In many chronic cardiac diseases associated with cyanosis, notably for example in *morbus ceruleus*, the temperature is slightly below the normal. Derangement of the functions of the stomach and other digestive organs, and the resulting inanition, are probably contributory causes (in addition to the defective aëration of the blood and imperfect supply of oxygen to the tissues) of the depression of temperature in cardiac cases associated with venous engorgement and dropsy.

3. *Jaundice.*—In jaundice the temperature is also below the normal. Whether the fall in temperature is due to derangement of the digestive organs, to the depressing influence which the presence of bile in the blood has upon the heart and circulation, or to the direct action of some constituent of the bile upon the nerve (heat generating) centres, is not definitely known.

4. *Diabetes mellitus.*—The exact cause of the subnormal temperature which is met with in this disease is undetermined. The subject is one which seems to me to require investigation, for the fact that in diabetes —a disease characterised by emaciation, and in which large quantities of food are ingested,—an excess of urea is discharged in the twenty-four hours, seems at first sight[1] opposed to the increased metabolism theory of fever, and it is by the careful study of apparent exceptions that we may hope to elucidate many obscure points in medicine and pathology.

5. *Uræmia.*—In chronic, as in acute, uræmia, the temperature is subnormal. The low temperatures, which are met with in some cases of chronic Bright's disease, are usually due to this cause; though in the 'waxy' form of the disease, profuse diarrhœa is sometimes a potent cause of temperature depression.

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[1] The question, of course, arises, whether the excess of urea in diabetes is due to a *tissue* metabolism; whether, in short, it represents a metabolism capable of producing an increase of animal heat.

6. *Melancholia and some other forms of chronic insanity.*—Inanition and defective metabolism, the result of depression of all the vital forces, are probably the causes of the subnormal temperatures which are met with in these cases. During attacks of mania and excitement the temperature may be elevated.

THE DIFFERENTIAL DIAGNOSIS AND PROGNOSIS OF ALGIDITY.

Diagnosis.—The conditions which produce depressions of temperature are so numerous, and the diseases in which algidity may occur are so varied, that it is impossible to lay down any concise rules of differential diagnosis. In the detailed statement which has been previously given (see page 103, *et seq.*), the more important conditions which are likely to be associated with algidity have been enumerated; and the object of the observer must, of course, be first to carefully elicit all the facts (symptoms, physical signs, history, etc.); and then to endeavour to determine, by a judicial survey of these facts, what is *the* cause of the algidity in the special case under observation.

Prognosis.—In trying to form an estimate of the true significance of a subnormal temperature, the observer must not trust to the thermometer alone, but must take into account all the facts; he must, in short, as has been previously insisted upon, endeavour to take a broad and comprehensive view of the whole case.

Provided this general statement is always kept in view, much help will be derived in this matter of prognosis from the following conclusions of Redard,[1] which seem to me so important that I make no apology for giving them in considerable detail:—

'Falls of temperature have not such a prejudicial effect upon the economy as elevations.

'The power of resisting cold varies with age; considerable falls of temperature in young children do not necessarily indicate a serious prognosis; in old people, on the contrary, algidity is an alarming symptom. If the central temperature falls rapidly, death follows in the majority of cases.'

'Peripheral depressions of temperature are not, *as a rule*, serious.

'A *rapid* peripheral depression is not serious, unless it is prolonged (cholera, etc.).

'A notable difference between the central and peripheral temperatures, is an unfavourable indication.

'A *continuous* fall of temperature, when it is *general* (central and peripheral) and *progressive*, even if it is not great, is unfavourable.

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[1] *Traité de Thermométrie Médicale*, page 275, *et seq.*

'The greater the fall the greater the danger.

'A temperature which remains any length of time below 35° C.= 95° F., indicates a serious condition (cholera, etc.).

'If the fall is only temporary (even if it is considerable in degree), and if it returns slowly to, and remains at the normal, the case may recover.

'When the central temperature falls, and the peripheral temperature is afterwards lowered, death follows (collapse in fevers, cholera, etc).

'If the temperature falls in the central parts and not at the periphery, death generally takes place after a short interval.

'If in the reaction, the rectal temperature is normal or above the normal, that in the axilla above the normal, and that in the mouth below the normal, it is a false reaction, and the prognosis is grave.

'It is a serious indication when, after a rapid fall, the temperature rises rapidly above the normal (collapse, surgical shock).

'Collapse with a high temperature is more serious than collapse with a low temperature.

'Collapse with a depression of the central (rectal) temperature does not indicate a fatal prognosis, if there is at the same time a fall in the frequency of the pulse and respirations; this state may indicate the commencement of convalescence.

'A return of algidity indicates a fatal prognosis.

'During the period of convalescence of some diseases characterised by a subnormal temperature, if, after the temperature has returned to the normal, it suddenly falls again below the normal, the prognosis is very serious.

'Falls of temperature (relatively low temperatures, pro-agonistic falls of Wunderlich), occurring in the course of a serious fever and giving a false remission, are a deceitful indication. If with the fall in temperature the pulse is small and rapid, and if all strength seems exhausted, the patient will probably die.

'A fall in temperature, which occurs in certain diseases (typhoid), towards the tenth or twelfth day, is far from unfavourable.

'A rapid fall of temperature occurring in the course of a case of typhoid which has (up to the fall) presented a regular course (as regards the temperature), is often an indication of perforation of the gut or intestinal hæmorrhage.

'A slight and temporary fall towards the termination of a case of fever is an indication of the crisis and of convalescence.'

Redard gives several other indications, which space does not allow me to quote. The reader is advised to refer to the original which, on this and other points, is exhaustive and admirable.

SURFACE TEMPERATURE ALTERATIONS.

Although there are, without doubt, marked differences, both in health and disease, in the temperature of different parts of the surface of the body, the subject of localised surface temperatures is one of comparatively little importance to the practical physician. Some enthusiastic observers have, it is true, stated, that the temperature alterations on the surface may be taken as exact indications of the condition of subjacent organs; and it has even been claimed that the temperature condition of localised spots on the surface of the scalp is indicative not only of pathological changes, but even of functional variations in the limited portions of brain which are situated immediately beneath, but these results have been disputed by trustworthy and competent authorities. The results of different observers are so contradictory, the sources of error are so numerous, and the exact observation of minute differences in surface temperature is so difficult, that localised surface temperatures are of comparatively little use in actual diagnosis. The subject need not, therefore, be considered in any great detail.

Mode of observing localised surface temperatures.

In order to observe with scientific accuracy the exact temperature of a limited spot on the surface of the body, a thermo-electric apparatus is necessary, for no one of the many thermometers which have been invented for the purpose seems absolutely reliable.[1]

For clinical purposes, where *absolute* accuracy is not essential, the ordinary self-registering mercurial thermometer, the metallic thermometer of Immisch, or, better, one of the special surface mercurial thermometers may be used.

Personally I have hitherto been in the habit of using either:—(1) an ordinary self-registering mercurial thermometer, strapping the instrument on to the surface of the skin, the temperature of which I wished to observe, and covering the bulb with a piece of lint or cotton wool; or (2) a surface mercurial thermometer having a spiral flat reservoir (see fig. 40), which allows a larger surface of the mercury to be placed flat upon the skin.

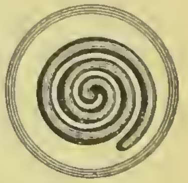

FIG. 40.—*Spiral reservoir of mercurial surface thermometer.*

Redard disapproves of covering the reservoir with a non-conducting material (lint or cotton wool). He says that none of the surface thermometers which have as yet been invented are absolutely accurate; he recommends the thermometer of Voisin (see fig. 41) as being the best, and says that it is sufficiently precise for most practical purposes.

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[1] The various forms of thermo-electric apparatus are described in Redard's work.—*Traité de Thermométrie Médicale.*

Precautions to be taken in observing the temperature of a localised portion of the skin, and in comparing the surface temperatures of corresponding parts of the body.

1. The reservoir of the thermometer must be accurately applied and kept by means of moderate pressure in exact contact with the portion of skin the temperature of which is to be ascertained.

2. In order to have a reliable result, the ordinary mercurial surface thermometers should be retained in position for at least fifteen or twenty minutes.

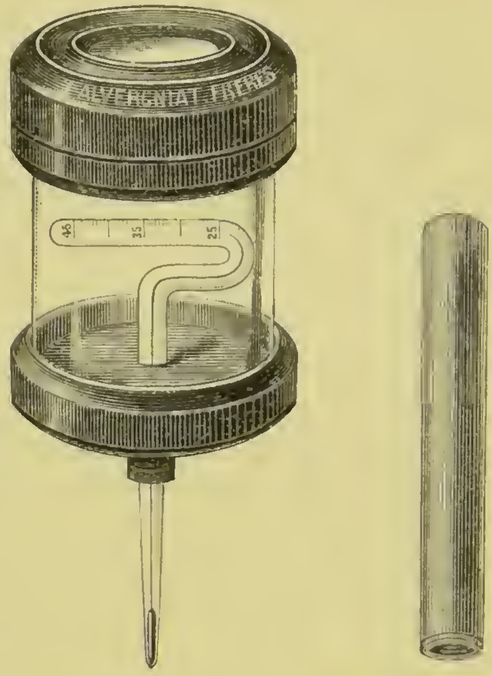

FIG. 41.—*The surface thermometer of Voisin.*

3. During the observation, the patient must remain at perfect rest, and care must be taken that there is no friction between the bulb of the thermometer and the skin, and that no external source of heat (such as the hand of the observer) is allowed to come in contact with the reservoir of the instrument.

4. In comparing the temperature of corresponding points of the surface on the two sides of the body (say the two legs) the greatest care must be taken, that all the conditions are absolutely identical. The surfaces of skin to which the instrument is applied must be symmetrical; the thermometers must be applied in exactly the same manner, and retained in position for exactly the same time; the parts to which the thermometers are applied must be placed in exactly the same position and exposed to the same external conditions—one leg, for example, must not be flexed while the other is extended, for the difference in position may modify the circulation, and so materially affect the temperature; nor must one leg be exposed to the atmosphere, and the other covered with bed clothes, for the surface temperature is, as has been previously pointed out, very readily affected by external conditions. It is, too, absolutely essential that for some time (at least fifteen or twenty minutes) before the observation is made.

the corresponding points should be identically situated in every respect, in order that modifications due to temporary and external conditions (circulation, exposure, etc.), may, so far as possible, be eliminated.[1]

SURFACE TEMPERATURES IN HEALTH.

The temperature of different parts of the surface of the healthy body has been studied by numerous observers. Redard concludes, as the result of the observations with his thermo-electric apparatus, that there is on the surface of those regions the temperature of which is relatively[2] high (the chest and abdomen), a mean temperature which is almost constant for the same individual; while on those regions, where the temperature is relatively low (parts situated at a distance from the trunk, the hands, feet, tip of nose, for example), the temperature is continually undergoing marked alterations.

In the following table, some of the results which Redard obtained as to the temperature of different parts of the body, are summarised:—

TABLE SHOWING THE TEMPERATURE, IN DEGREES FAHRENHEIT, OF DIFFERENT PARTS OF THE BODY.

(Summarised from Redard.)

INTERNAL.		*Rectum and Vagina,*		99·5 to 100·04.
		Axilla,		99·32 to 99·68.
		Mouth,		99·32 to 99·5.
		Groin (thigh flexed),		99·32.
SURFACE.		*Chest,*		92·3 (infra spinous region) to 98·6 (infra clavicular region).
		Abdomen,		95·9 (epigastric region) to 98·42 (right hypochondriac region).
		Head,		95·18 (right parietal region) to 97·52 (left frontal region).
		Nose,		87·8.
		External Auditory Meatus,		87·8.
	Upper Limb,	Acromian process,		87·8.
		Upper arm,		92·3 (posterior surface) to 94·64.
		Forearm,		91·76 (posterior surface) to 93·2.
		Hand,	Palm,	95·9.
			Dorsum,	92·3.
			Tips of fingers,	92·3.
	Lower Limb,	Thigh,		91·76 (internal surface of lower part) to 95·9.
		Knee, ligamentum patellæ,		90·5.
		Leg,		93·38 (external surface of lower third) to 94·64 (posterior surface of upper and middle thirds).
		Foot,	Plantar surface,	94·1.
			Dorsum,	89·96.
			Tips of toes,	89·22.

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[1] For further information as to the temperature of localised portions of the body, the reader is referred to the original.—*Traité de Thermométrie Médicale*, page 385, *et seq.*

[2] In the original the word *assez* is used.—I have translated it *relatively*.

The differences of temperature which normally exist between different parts of the surface of the skin seem to be chiefly due to the following conditions:—(1) the proximity of different parts of the skin to the trunk (centre of the body); (2) the proximity of different parts of the skin to large vascular trunks and to large active organs richly supplied with blood, such as the muscles and the liver; (3) the structure of the skin itself (its thickness, richness in vessels).

Diurnal and temporary variations of surface temperature.—When the temperature of the same portion of skin is repeatedly examined in the course of the twenty-four hours, diurnal variations corresponding to the diurnal variations of central temperature (see page 56) are observed; and temporary variations, which occur at irregular intervals and are often very marked in degree, may often be observed, more especially in those portions of skin which are most exposed and peripherally situated. These differences may be due either to *external* or *internal* conditions. Amongst the former (external causes of alteration) the temperature of the atmosphere and the way in which the parts are protected by clothes are the most important; while, amongst the latter (internal causes), anything which modifies the temperature of the body as a whole (central and general causes), or the condition of the localised portion of skin, the condition of which is being investigated, may be mentioned as the chief.

Variations in the circulation in, and activity of, large organs near the surface of skin which is being examined; and variations in the blood-vessels and sweat-glands in the localised portion of skin itself, materially affect its temperature—the temperature rising when the blood-vessels dilate and the circulation becomes more active, and during the secretion of sweat. Now since the localised variations in the condition of the blood-vessels and of the sweat-glands are largely regulated by the vaso-motor nerves, it follows, the condition of the nerve centres and of the nerves distributed to the particular portion of skin under observation must exert a most important influence upon the condition of its temperature.

Further, the temperature on the two sides of the body may be different, even in perfect health (the differences usually ranging from 0.36 to 0.72 of a degree Fah.). Nor is this difference constant, for in the same individual the temperature may at one time be higher on the right than on the left side; while at another, the exact reverse of this is observed.

SURFACE TEMPERATURES IN DISEASE.

Variations in the temperature of the whole surface, and in the temperature of localised portions of the skin occur in many different diseased conditions, amongst which the following may be mentioned:—

1. *Febrile diseases.*—In febrile diseases, the surface temperature, as a rule, conforms to that of the centre of the body. There are, however, some notable exceptions ; and the comparison of the central and surface temperatures in fever is of importance, and yields, in some cases, information which is of real value in prognosis.

During the stage of rigor, there are often, as has been previously pointed out, marked differences between the central and peripheral temperatures. During the height of the fever, these differences for the most part disappear, and the central and peripheral temperatures run a parallel course. During the terminal periods of the attack, the parallelism is less constant, and, in some cases, more especially in the condition which Wunderlich has termed pro-agonistic collapse, very striking differences are observed.

2. *General algidity.*—In cases characterised by general algidity, the peripheral is often more depressed than the central temperature. In some cases the reverse is observed, the prognosis is then most unfavourable. The chief causes of general algidity have been detailed (see pages 103 and 111), and need not again be mentioned.

3. *Lesions of the nervous system attended with unilateral symptoms.*—In cases of this description, the temperature is often different on the two sides of the body.

(*a*) *Cerebral lesions.*—In hemiplegia, due to cerebral hæmorrhage, which may be taken as an illustration, the temperature on the paralysed, is usually different from that on the sound side. The three stages of alteration which have been described as affecting the general (central) temperature, may also be demonstrated on the surface of the body. According to Blaise (quoted by Redard), the paralysed limbs cool more rapidly than the sound ones, during the stage of primary depression.[1]

After the period of primary depression, the temperature of the paralysed is usually a little higher than that of the sound limbs. This condition can, in many cases, be demonstrated for a period of two years

In very chronic cases (after two years), and more especially in those cases in which there is much muscular atrophy, the temperature of the paralysed, is usually a little lower than that of the sound limbs. In cases of chronic hemiplegia, the temperature of the paralysed limbs is, within certain limits, more easily modified by external variations in temperature, the paralysed limbs being more quickly cooled when exposed to a cold atmosphere, and more quickly heated when exposed to a hot atmosphere, than the sound ones.

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[1] *Loc cit.*, page 446.

(*b*) *Spinal lesions.*—The exact condition of the surface temperature in cases of spinal disease and injury has not been sufficiently studied to allow of any definite statement being made. Without doubt, temperature modifications, which are, in all probability, largely due to vaso-motor derangements and muscular atrophy, do in many cases occur; and in cases in which the symptoms are chiefly unilateral, it is not unreasonable to suppose that some differences in the surface temperature of the two limbs may be present. I must, however, most strongly emphasise the fact, that too much importance should not be attached to differences of this description. In railway compensation cases, for example, in which it is alleged that paralysis of some part, say of one leg, is present, great importance is sometimes given to the fact, that a slight difference in temperature has been detected on the two sides of the body. The counsel for the plaintiff may state, that such a difference in the temperature is a definite physical fact which has been demonstrated by means of an accurate scientific instrument—the thermometer—and that it is an objective physical sign which does not depend upon the mere statement or sensations of the patient. Further, it may be argued, that such a difference in temperature is the usual condition in cases of one-sided paralysis and is known to result from disease; hence it must be allowed, that the presence of such an alteration in the case under observation is very strong (perhaps it may even be stated conclusive) evidence that the patient is suffering from undoubted organic disease.

Such a chain of reasoning, which is not drawn from the imagination, may be quite erroneous. Slight differences in the surface temperature of two corresponding parts of the body—say of the two legs—are *per se* of no importance whatever. Such differences can frequently be demonstrated, in fact are the rule, in perfectly healthy individuals. Unless then, other definite indications of organic disease are present, little or no value should be attached to them.

But even when there are other indications of disease, differences in surface temperature should be ignored, unless it is absolutely certain that the observations have been made with the necessary precautions, care, and accuracy, and by an unprejudiced observer, desirous above all things of eliciting the truth. In short, here, as in almost every clinical observation, the 'personal equation' comes largely into play, and the value which is to be attached to the results depends entirely upon the value which is to be attached to the observer, in other words, upon the powers of observation of the observer, his accuracy, truthfulness, and soberness of statement. For this, among other reasons, the personal intercourse of men of science is eminently desirable,—the opinion which one forms of a man from his writings is often an erroneous one, the value which is to be attached to his reliability and truthfulness—in other words, the personal equation—can only be determined by personal intercourse.

(c) *Lesions of peripheral nerves*, with (according to Redard) the exception of contusions, compression, and stretching, are usually attended, for the first few days after the injury, with an elevation of the temperature of that portion of the surface to which the nerve is distributed. After the primary elevation, the temperature returns to the normal. In old standing cases, the temperature is usually lowered, the depression being most marked in those cases in which there is much muscular atrophy.

4. *Diseases of the skin and subcutaneous tissues.*—Localised inflammations of the skin and subcutaneous cellular tissue are accompanied by local elevations of temperature, but the temperature of the inflamed part never exceeds, and rarely equals, that of the centre of the body.

New growths in the skin, which are growing rapidly and which are highly vascular, such as rapidly growing sarcomata, are usually accompanied by some elevation of the surface temperature; but the temperature of the skin over new formations of slow growth is normal or slightly depressed.

5. *Disease of the deeper organs and tissues.*—Inflammation of the more deeply situated organs and tissues is frequently also accompanied by elevation of the temperature of that portion of the surface under which they are situated. The extent of the elevation and its value in diagnosis depend, partly upon the intensity of the inflammation, but chiefly upon the relationship of the organ to the surface. Proximity to the surface, and a free vascular connection between the inflamed organ and the parieties, favour localised elevation of temperature. In peritonitis, for instance, the surface temperature of the abdomen is elevated, a fact which may be of diagnostic importance in some cases in which the presence of fluid has been detected in the cavity of the peritoneum.

The alterations of surface temperature which result from inflammations of the more deeply situated organs, are usually so small in amount; the results which have been obtained by different observers are so contradictory, the difficulties of exact observation are so great, and the causes of fallacy are so numerous, that the condition of the surface temperature of the abdomen, thorax, and head, cannot at present be regarded as a practical and trustworthy method of diagnosis.

Note.—For further information on this and other points connected with surface thermometry, the reader is advised to consult Redard's work, to which I am indebted for many of the foregoing facts and statements.

APPENDIX I.

Out-Patient Practice: Mode of Conducting: its Difficulties, Advantages, and Disadvantages as a field for Clinical Teaching and Original Observation.[1]

In commencing the work of another session in the out-patient department of this Infirmary, it may perhaps be well for me to make a few remarks with regard to the manner in which I think it advisable to conduct this clinique, and to put before you some of the advantages which out-patient practice affords for clinical teaching.

I must premise what I have to say, by stating that the objects which the physician ought to have in view in conducting out-patient practice, in a large teaching hospital such as this, are, in my opinion three-fold.

In the *first place*, he has to determine what is the matter with the patients; to send to the hospital wards those cases which are suitable, and which desire to be admitted; to prescribe for those cases which are not fitted for admission, or which do not wish to come into the hospital, and to give them directions as to their diet, hygienic surroundings, and mode of life generally; in short, to advise them as to what they should do and what they should not do, in order that they may be cured or relieved of the diseases with which they are affected.

In the *second place*, he should utilise to the utmost the very great advantages which the out-patient department affords as a field for clinical instruction. This I hold to be a most important point in this great school, where the number of students is so large in proportion to the number of in-patients. The teaching must, however, always be considered as secondary and subordinate to the examination and treatment of the patients; and the greatest care must be taken that the teaching is judiciously conducted, and that no patient is subjected to a prolonged examination who is in the least likely to be injuriously affected by it.

In the *third place*, he should endeavour, so far as opportunity allows, to make original observations, and to do what he can to advance the science and practice of medicine.

Method of Conducting.—Now, to satisfactorily accomplish all three objects at the sametime is by no means easy. The method which I adopt

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[1] Being introductory remarks made at the author's out-patient clinique at the commencement of the Winter Session 1886-87.

—and it seems to me the only one which is capable in any satisfactory degree of meeting all the requirements of the case—is as follows:—As each patient is admitted to this large room, I ask him to take a seat in front of me, the students being seated or standing in a semicircle round us. I then ask him his name, age, occupation, and address, his answer to these preliminary questions being copied by a clinical clerk into the hospital register, while I myself enter them in my private note book.[1]

At this stage of the examination, I take care to direct attention to the physiognomy of the case; in short, to point out any striking external appearances which may be present. You will soon see the immense importance of this kind of information, and will soon come to appreciate the advantage and necessity of minutely observing every particular connected with the patient (facial appearance and expression, colour, state of nutrition, condition of breathing, tone of voice, manner, bearing, etc.).

You will find that in some cases it is possible, even before the patient has been asked a single question, to come to a positive conclusion as to the nature of the disease from which he is suffering; while in most cases the impression which the physician receives from the physiognomy of the case, or the *tout en semble* of the patient, suggests the line of investigation which should be followed, and the questions which should be put; in short, directs the whole plan and scope of the examination. Even when I do not tell you in so many words the suggestions I have received from the physiognomy of the case, you will soon perceive them from the nature of the questions which I put to the patient.

A knowledge of the physiognomy of disease; in other words, a knowledge of those alterations in the external appearance, gait, voice, manner, etc., of the patient, which are associated with different diseased conditions of internal organs, and the training of the faculty of rapidly and accurately noting every minute particular which can possibly throw any light upon the pathological condition of the patient and the nature and extent of the disease from which he is suffering, are better acquired in the out-patient department than in the wards, where the patients are usually seen in bed; and I need not say that you will find this kind of knowledge of the utmost value in your future practice.

I next ask the patient to specify the nature of his complaints;

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[1] I find it advisable to devote two clear pages to each case. Even should nothing else be entered, than the preliminary particulars just mentioned, and a few words descriptive of the case, it is, I find, better to pass on to the next page, and to sacrifice a little paper, rather than to run the risk of confusing and jumbling up the records of two cases, and of being hampered for want of space when the notes of the case come to be filled up.

question and cross-question him with regard to his symptoms; and elicit any points in his previous history or hereditary tendencies which may appear to have a necessary or important bearing upon his present condition.

In making this—the oral examination, I do not rigidly adhere to any hard and fast rules, but alter the plan of my examination as the requirements of each individual case seem to demand. My object is to get all the necessary and leading facts in as little time and with as few questions as possible. Each question which is put has its point By following this part of the examination, you will learn the method of conducting the oral examination, and will get valuable hints as to the different modes of eliciting information, and of dealing with patients of different temperaments. During the whole time of the oral examination, I keep up a running commentary, and do not hesitate to enter into a detailed discussion of the symptoms whenever it seems necessary or desirable to do so.

When this part of the examination is completed, I take care to point out the direction in which the symptoms point, to tell you the probable nature of the case, the organ which seems to be affected, and the points to which attention should be directed in making the physical examination.

I then direct the patient to go into the male or female side-room (as the case may be), and partly undress. Suppose, for instance, that the patient is a male, and there is reason to suspect disease in the thorax or abdomen, he is made to go into the male side-room and strip to the waist; if there is reason to suspect disease of the spinal cord or lower extremities, to strip below the waist. Male patients and children are always brought back into the large room and examined before the students. (A high bed is placed in the centre of the room for this purpose.) Owing to the somewhat inconvenient arrangement of the female side-room (it does not directly communicate with the large room in which the clinique is held, but through the passage by which all the patients are admitted from the general waiting-room), it is not always possible to carry out the same plan in the case of females.

While the patient is undressing, I either continue my remarks on the case; or, if I have said all that is necessary, call in another patient for examination.

When the patient is undressed, he is brought into the large room, and the physical examination is made before the students. Any alterations in the physical signs which can be made apparent to the class (such as visible jerking pulsation in the brachial arteries, capillary pulsation on the forehead, the condition of the reflexes, marked alterations in the percussion note on the two sides of the thorax, etc.) are always carefully demonstrated; and other physical signs which can only be perceived by personal observation, such as the presence of cardiac thrills and murmurs, are carefully described. The urine is examined in all cases in which there is reason to suspect the presence of albumen, sugar, etc.; the microscopical characters of the blood, the electrical condition of the muscles, the sphygmographic characters of the pulse and the cardiographic characters of the heart beat are occasionally demonstrated in those cases in which there is reason to suspect any marked departure from the normal. The black board is called into frequent requisition, and is found a most valuable aid to clinical teaching.

The significance of the physical signs is then discussed; and the diagnosis and differential diagnosis fully considered.

The patient is then sent into the side-room, and *provided that there is no risk of his being injuriously affected by further examination*, he is there percussed, auscultated, or otherwise examined by any member of the class who may wish to verify the facts which have been previously elicited.

While the patient is in the side-room the prognosis and treatment are considered. Finally, after he is dressed, he is again brought before the students. If he desires to be admitted to the hospital he is sent to the wards. If he does not wish to come into the Infirmary, as much of the opinion which has been formed as it may seem advisable, is communicated to him; he is instructed as to diet, mode of life, etc., and is handed a prescription which has been previously dictated to a clinical clerk.

In cases of severe illness, the extent of the examination is reduced to a minimum, and the patient is immediately sent on to the wards, or, when he does not wish to come into the hospital, prescribed for and dismissed with as little delay as possible.

During the course of the oral and physical examination, I enter in my private note-book the leading particulars of each case, and any definite facts (such as measurements, pulse rate, etc.) which it would be difficult to remember. The notes are afterwards filled in from memory, and the case, so far as possible, completed. Personally I find no difficulty, with the aid of such brief notes as I make during the course of the examination, in remembering for a few hours all the leading details of each individual case. I endeavour to fill in the notes as soon as possible after the clinique, and I always make a point of completing the record the same night.

The method of conducting the out-patient clinique, which I have just described, is the best which I have been able to devise for attaining the three-fold object which I have in view, in the presence of a large audience. With a limited number of students it would be possible—though, for the reasons which will presently be mentioned when I come to speak of the class of students for whom out-patient practice is best fitted, I am not at all convinced that it would be better—to allow each student in turn to auscultate and percuss the patient under the eye of the physician; in fact, to conduct the clinique more as a tutorial class. With the number of students who usually attend here, such a method of procedure is quite impossible. We must necessarily adopt that method which gives the best results to the many rather than a method which would perhaps be most advantageous to the few. Let me add, that it is essential that every one should maintain absolute silence. The slightest whispering not only distracts my attention, and prevents me carrying out the examination—more especially the auscultation—in a satisfactory manner, but it interferes with your comfort, takes your attention away from the matter in hand, and makes it impossible for every one in the room to see, hear, and appreciate all the minute and fine details of the case. I find, too, that if absolute silence is to be maintained for two or three hours on the stretch, that your attention must be kept on the *qui vive*, and your interest constantly excited. It is for this reason that I am continually talking and demonstrating, and that I endeavour to make the whole examination before you. If I have to go into the side-room to make an ophthalmoscopic examination or to examine a female patient, my assistant takes my place, a new case is called in, and the work is never for a moment allowed to flag or falter.

Difficulties and disadvantages of out-patient practice; mistakes.—One of the difficulties which we have to contend with in out-patient practice is the number of patients who come for advice. On the days when I attend (Wednesdays and Saturdays) the work is not, as a rule, so heavy as it is on the earlier days of the week. The number of new cases which I have had to see during the past six months, has usually been from sixteen to twenty per day, and I find that I can generally get through the work, going pretty thoroughly into the cases, in the manner I have just described, and at the same time doing a considerable amount of teaching, in three hours. It is, however, hard work. One's attention has to be constantly on the stretch; and from the fact that so much work has to be done in such a short time, it necessarily happens that important facts are sometimes not elicited, and that there are some mistakes. I think, however, you will find that, as a rule, the examination is tolerably complete; and I trust that those of you who follow the cases up in the wards—and let me strongly advise you to take every opportunity of doing so—will find that the mistakes which do occur are those of omission rather than of commission. And here let me say that no one is infallible, but that every one makes mistakes. If it were possible to imagine any one who professed never to make a mistake, he would either be a fool or a liar, for he would either be so ignorant that he would not recognise his mistakes, or knowing the mistakes, he would wilfully conceal them. As you pass through life you will, I think, generally find that the men who are least candid about their mistakes and most anxious to conceal them, are usually those who make the most. From the intricate nature of the problems with which we have to deal, and the difficulties which, in many cases, attend the investigation of disease, the most able and experienced practitioners must necessarily make mistakes. It is not a question of who makes and of who does not make, but simply of who makes the fewest mistakes. But there are mistakes and mistakes.

There are the mistakes of commission—the bad mistakes, as we may term them—mistakes which show gross ignorance, incompetence, or culpable negligence, as for example, the inability, after careful examination, to detect striking clinical facts, such as marked alterations in the physical signs.

Then there are the milder mistakes—those of omission, which are often due to imperfect or hasty examination, and which are especially liable to occur to the overwrought practitioner and in the hurry of out-patient practice.

Lastly, there are mistakes due to errors in judgment—the mildest mistakes of all—as for example, those mistakes which are due to an erroneous estimate being attached to certain facts (too much importance to some, too little to others); or, when the relative importance of the different facts is correctly estimated, to an erroneous or illogical conclusion being drawn from them. Mistakes of this kind (errors of judgment) are exceedingly common in practice; nor is this to be wondered at, when it is remembered that there is probably no faculty of the human mind which differs more in different individuals than the faculty of judgment—the power of being able to weigh correctly all the facts of a case, and of drawing the correct and logical conclusion from them. Like every other mental faculty, this power of judgment can fortunately be cultivated—for this, amongst other reasons, a thorough mathematical training is, in my opinion, so eminently desirable for boys who intend to take up medicine or science as a profession.

On account of the enormous extent of modern medicine, the difficulty that there is in some cases of eliciting the facts of the case and of making a thorough and satisfactory examination, the extreme complexity of many of the problems which the physician has to decide and the natural imperfections which are inherent in every human mind it necessarily follows that mistakes must arise. But we may take comfort in remembering that there is nothing so instructive, to the man who makes it, as a mistake; this is one of the reasons why the tutorial system of teaching by question and answer is so eminently helpful. Now, like yourselves, I am simply a student; one of the main objects which I have in view in giving the amount of time and trouble that I do to this out-patient work, is to learn and to teach myself; and although I dislike quite as much as any man to be found making a mistake, yet I am always anxious to know when I do fall into error or make a slip. When therefore any of you think that I am making a mistatement or a mistake, I shall always be obliged if you will point it out. For the same reason, if there is anything I fail to explain to your satisfaction or to make quite clear, by all means question me about it. I am no advocate of *ex cathedrâ* teaching. I only regret that the time at our disposal and the amount of work which we have to get through, makes it impossible to enter into long discussions—a mode of teaching senior students which I used so thoroughly to enjoy in the wards of the Newcastle Infirmary.

Physiognomic diagnosis.—And this leads me to say, that you may perhaps sometimes think that I jump at conclusions, or arrive intuitively at results. After looking at the patient, and perhaps asking him one or two questions, I will often tell you that he is *probably* suffering—sometimes I may even go the length of saying that he is actually suffering—from some particular affection. Now there is nothing miraculous and intuitive about this; it is a process which every practitioner is constantly carrying out; although he may appeal to the uninitiated to arrive intuitively and almost miraculously, at the result, it is simply a matter of experience and observation. It is perfectly true that the process of thought is almost instantaneous; that the process of reasoning by which he arrives at his result is, in many cases, carried on quite unconsciously; and that he may actually, in some cases at all events, find it difficult to explain all the steps in the process; yet he ought to be able to unfold, more or less clearly, the whole process and chain of thought. If he cannot explain the grounds of his opinion, he is, you may be quite sure, in many cases at all events, simply making a guess. However eminent the practitioner, however emphatically his opinion may be expressed, I should, speaking generally—hesitate to attach any great importance to it, unless he is able to explain the grounds of his opinion, and the reasons which have induced him to arrive at his result. There are doubtless some exceptions due to the facts that it is often very difficult to analysis our mental processes and to give the grounds for our conclusions, and that some men have more difficulty in making this sort of mental retrospection and mental analysis than others. Let me make my meaning clear by means of an illustration. Those of you who attend my practice here know that I can generally recognise a pitman the moment he sits down before me, and before a single question has been asked. Only a week ago, those of you who were up during the vacation, will remember, I asked a patient whether he was a pitman, he said no, he was a shoemaker; but I felt so sure of my conclusion, that I then asked him if he had not been a pitman; he then stated that he had followed his present occupation for three years, but before that he had all his life worked down the pit. This conclusion was simply the result of experience and observation. In my work at the Newcastle Infirmary I saw a great many pitmen. They are seldom tall, generally muscular and strongly built, but pale in the face from working underground away from the light; when they come to a physician they often do so because of some chest complaint (bronchitis, asthma, phthisis) evidence of which may frequently be seen at a glance (emaciation, slight dyspnœa, cough, barrel-shaped thorax, etc.); their dress is certainly peculiar—I am of course speaking of recognising pitmen who are washed and clothed in their Sunday rig out—the necktie, and the manner it is tied are, I think, the most important points, and often, quite irrespective of anything else, suggest to me that the patient is a pitman. Well, when I am led to suspect, by observing these points, that the patient is a pitman, I almost unconsciously and instinctively, as it were, glance at his hands; if I see any blue marks (the hands must be placed in a good light, for these marks are often small and difficult to see at a distance), I feel sure of my conclusion, for these blue marks, which may frequently also be seen on the face, and on other parts of the body when the patient is stripped, and which are the result of coal dust getting into cuts and scratches and becoming tatooed, as it were, into the skin, are highly characteristic.

Now, to be able to recognise a pitman at a glance is of no importance whatever; for the fact could be much more certainly and quite as easily ascertained by a single question; but it illustrates the most important fact, which I cannot too strongly impress upon you, viz., that long experience and minute observation enable any one of average ability to arrive at conclusions which, to the uninitiated, appear little short of miraculous; and, when I further tell you, in the eloquent words of Professor Gairdner, that 'the experience of years and the critical appreciation of the human form under a great variety of conditions, normal and abnormal, gives the physician, in many cases, a power akin to the artist, incommunicable by words; an instinct of divination, so to speak, by which the true character and history of the organism may be read in the external features and physical characteristics; and this not only as to health and disease, but as to all the leading elements of character,' you will see the immense importance of cultivating to the very utmost this faculty of observation and of making yourselves familiar with those external alterations and characteristics with which disease of the internal organs is so frequently associated.

Deferred diagnosis.—You will sometimes find that, after the most careful and prolonged examination, I am unable to arrive at a positive conclusion as to the nature of the case, and that I defer the diagnosis, and leave the matter in doubt. In such cases, I always endeavour to carry the diagnosis as far as possible, and to explain to you the reasons for my hesitation and doubt. This is a procedure which every practitioner now and again adopts. In some cases, the facts are not sufficient to warrant a conclusion; in others, although sufficient facts are in reality present, yet their observation is attended with so much difficulty, or the case is so complex, that it is desirable before committing oneself to a final opinion to examine the patient again and again and to take time to think over the case.

I repeat this is a truly scientific method of procedure, which every one who wishes to arrive at the best possible conclusion must occasionally adopt. On first entering practice, you will, of course, be frequently in doubt; and until you have thoroughly acquired the confidence of your patients, you may feel some difficulty in telling them when they ask for your opinion, as they usually will do, that you are unable to form a positive opinion as to the nature of the case; for you naturally may think that they will attribute your hesitation and doubt, not to the intrinsic difficulties of the case, but to want of experience and knowledge; and no doubt in some cases they would be correct. Tact and ingenuity enable some men to get out of the dilemma, but you will, I think, generally find that the straightforward course is in the end the best; sensible and intelligent people will seldom be dissatisfied if you tell them the case is one of difficulty, and that you think it necessary, before making up your mind as to its exact nature, to take time for consideration and further observation. Once you have gained the confidence of your patients and acquired a certain reputation, there is no need to hesitate as to the course you should adopt.

Let me give you an illustration of the kind of case in which it is necessary to defer the exact diagnosis: a patient comes before us, we will suppose, with symptoms of intra-thoracic pressure; on physical examination, it is evident that there is a tumour within the chest, but it is difficult, or it may be impossible to decide at the first interview whether the tumour is an aneurism or a solid growth; the evidence may seem to be evenly balanced, and sometimes, though it must be confessed rarely, this is actually the case. The chances being equal, there is a temptation to ignore the difficulties, and to pronounce an emphatic and positive opinion in favour of one or the other condition. The odds being equal, the practitioner may deliberately choose to run the risk of being wrong, knowing that if he happens to be right he will gain more credit from being right, that he will gain discredit from being wrong. This is exactly the principle on which the bone-setter makes his reputation, the public hear of the few successful results, they are widely noised abroad both by the patient and by the operator, but the failures—the many gross mistakes and too frequently disastrous results—are forgotten, or make comparatively little impression on the public mind. As a matter of experience, it is found that one thoroughly successful result is quite sufficient to counterbalance a large number of serious errors. Now, we will suppose that our patient, with the intra-thoracic tumour dies; the positive diagnosis which has been hazarded is found to be correct, the physician congratulates himself, and is congratulated over the result, people talk of the wonderful diagnosis which Dr So-and-So made, apparently without any difficulty, when others deferred their diagnosis, and were in hesitation and doubt. Well, another doubtful case presents itself, the same process is adopted, but this time the guess, for it is nothing more, is not correct. The temptation to appear brilliant at the risk of failure, where the chances seem equal, and to carry the diagnosis further than the facts of the case warrant, is a strong one, but it should be sternly resisted and suppressed. Like all other temptations, it grows stronger and less easily resisted, the more frequently it is allowed to get the upper hand, until finally it becomes a matter of habit and routine. Now, the object of the diagnostician ought not to be to make a few happy and apparently brilliant hits, mixed up with an equal number—it may, and probably will be, with a greater number—of mistakes, but to *arrive in every case at the best possible conclusion which the facts warrant.*

Scientific caution is a quality which cannot be too highly honoured; and it cannot be too strongly insisted upon, that in forming a conclusion it is better to err on the side of caution rather than of rashness. Caution may, however, be carried to an extreme. In the great majority of cases which come before the practitioner, the facts are quite sufficient to enable a competent man to come to a positive conclusion. When one finds a man constantly or very frequently hesitating to give a positive opinion, one naturally thinks that he is not able to form one, and that he is using cautiousness as a cloak for ignorance and doubt. One does occasionally meet with a shrewd man of the world who is not very strong professionally, who knowing by experience that when he does commit himself to a positive opinion he is apt to make a mistake, and recognising that positive errors tell injuriously against him, wraps himself up in the cloak of cautiousness, and tries to make capital out of his reserve, by posing as one who gives careful and well-considered opinions.

The out-patient department as a field for clinical instruction.—Turning now to the educational side of the question, you will find that the out-patient department affords very great advantages as a place of learning, and as a field for clinical instruction. The teaching in the out-patient department differs, however, in many important particulars from that which is carried on in the wards. Both have their advantages and disadvantages. Here we have to see a large number of cases in a comparatively short time; in ward teaching where there are many students, it is usually the custom to go thoroughly and with great carefulness and detail into one, two, or at the most three cases daily. In out-patient practice, the teacher knows nothing about the new cases which present themselves, and is thrown entirely upon his own inward resources and knowledge; if he is to succeed, he must be prepared not only to deal on the spur of the moment with everything that turns up, but to do so in a manner which will rivet the attention and command the satisfaction of his audience. Again, in out-patient practice, the teacher can never be sure of his material; the cases which present themselves on any given day may be uninteresting, and afford few points calling for comment. Let me say, however, that almost every case, however trivial it may at first sight appear, usually presents some points of interest and practical value, and that as a matter of fact, we rarely have a day here that some case of real scientific value and practical importance does not turn up. A series of unimportant and apparently uninteresting cases throw, however, a great strain upon the teacher, for if his audience is to be kept interested and on the *qui vive*, he must, under such circumstances, put forth all his energy and resource. In ward teaching, on the other hand, the physician can always rely upon having some suitable and interesting case; it is possible in fact to select one's subject; those cases which are chosen have generally been thoroughly worked up before hand; and the teacher is able, should it be necessary, to refer to authorities, and to look up any difficult or doubtful points. Such, at all events, was the method of ward teaching which I used myself to practise in the Newcastle Infirmary. Teaching in the out-patient department involves much more strain than teaching in the wards; and if it is to be successful, it requires, I find, a greater clinical experience and all round knowledge, and demands more teaching experience and teaching resource.

One of the greatest advantages which the out-patient practice affords to the student is the number and variety of the cases which come before him; the out-patient department, consequently, affords admirable opportunities of acquiring a knowledge of the external alterations and characteristic physiognomic appearances produced by disease, and of cultivating the habit of rapidly and accurately observing every minute particular connected with the patient. The immense importance of this has been previously insisted upon. I repeat, that the number and variety of the cases which the student is able to see in out-patient practice, is to him one of its great advantages.

But further, the cases are exactly the class of cases which you will see in your own consulting-rooms when you get into practice; many of the cases which you see in the wards are, on the contrary, cases such as you will not see, or will rarely see, in the ordinary routine of general practice. And here let me strongly urge you not to get into the way of thinking that any case is too trivial for attention. In ward practice, the cases are, as a rule, serious, the majority of them being cases of advanced organic disease; in the wards you will see comparatively few cases of functional disturbance, and none of the trifling and passing ailments which are of every day occurrence in private practice. In our work here, we constantly meet both with cases of severe organic disease, and with minor ailments and functional disturbances. You will consequently have an opportunity of seeing how the minor ailments are to be treated and dealt with; and let me say that, although in reality trifling, affections of this kind are often very real to the patient, and may occasion him quite as much trouble and anxiety as diseases of a much more serious nature. Many of these minor ailments and functional derangements rapidly get well when left to themselves; others—but not all—are very amenable to treatment; and you will find when you get into practice that one sometimes gets quite as much credit from the patient for the management of a trivial affection which would speedily have cured itself, as one gets for the most careful treatment of a serious and anxious case of organic disease. You will do well, then, to devote attention to functional derangements and trivial disorders of this nature.

But it is not only because it affords a field for acquiring a large experience of disease, and a great deal of absolute knowledge, that out-patient practice is so valuable. Quite as important, in my opinion, are the advantages which it affords of learning the different ways and methods of eliciting information; of examining, managing, dealing with, and pleasing patients; and of recognising the importance of that faculty which is perhaps more necessary than any other for great success in practice, viz., the faculty of impressing patients favourably and of inspiring confidence.

In this out-patient department you will see all varieties of mental temperament, and will come to understand the different ways in which differently constituted patients have to be dealt with. You will see, for instance, how, on the one hand, a few kind words and a kind and gentle manner, soon succeed in gaining the confidence of children and nervous persons; how, on the other, a little sternness and the exhibition of a little force of will speedily bring silly, gigling young women, or equally silly young men, to a sober and satisfactory mental condition. You will learn to appreciate the importance, in cases of serious sickness, of cutting short the examination and of avoiding, so far as possible, everything which is likely to distress or fatigue the patient; and you will come to see how important it is in some cases—as, for example, in hysteria, hypochondriasis and many other functional affections—to act through the patient's mind and nervous system upon his bodily condition—to throw your whole soul, as it were, into your opinion, and to do your utmost to impress him with the conviction that there is no organic disease, and that there is no reason whatever why he should not speedily get well.

And now let me say a word or two as to the class of students for whom the kind of instruction which the out-patient department affords, is best suited. The point is one on which there is, I believe, considerable difference of opinion. I understand that in one at least of the London Hospitals the junior students are recommended to attend the out-patient department, and the seniors are advised to confine themselves to the wards. This is, in my opinion, a very great mistake. I have no hesitation in saying that the out-patient department, as I conduct it here, is much better fitted for the senior than for the junior student. The beginner, desirous of acquiring the rudiments of clinical medicine and a knowledge of physical signs should, in my opinion, concentrate his attention on a limited number of cases, and should study first one organ and then another, making himself in this way gradually familiar *first*, with the normal physical signs (those which result from the physical condition of the healthy organ); *secondly*, with the pathological physical signs (those which result from the physical condition of the organ in different states of disease); and *thirdly*, with the chief functional derangements and symptoms which result from its more striking and important lesions.

It is only after he has acquired a considerable amount of knowledge, and has made himself more or less familiar with the different symptoms and physical signs, that the student is capable of deriving full benefit from out-patient practice. With so much work to do, it is, as I have already pointed out, essential to economise time as much as possible; to avoid asking any unnecessary questions; and to see that every question has its point. Now it is only the student, who has some knowledge of disease, who can see and appreciate the object of questions which are put in this way, and who can understand the mental analysis of the facts of the case which I am carrying on—as revealed by the questions which I ask—and can follow up my train of thought. It is only the advanced student who can thoroughly appreciate the physiognomy of disease, as it is exhibited in many different cases coming rapidly one after the other. Again, it is quite impossible with the limited time at our disposal,—even if it were desirable, which I do not admit—to explain the significance of elementary facts which are elicited in the course of the physical examination. In a case, for example, in which a double, blowing, endocardial murmur is audible over the course of the aorta and down the sternum, I do not stop to tell you that the murmur is indicative, and why it is indicative of aortic regurgitation—as I might think it advisable to do if I were teaching a class of beginners—I take it for granted that you know the significance of cardiac murmurs, and I proceed at once to direct attention to any special features which the case may present, and to the facts and circumstances by which we endeavour to determine whether the lesion has resulted from disease beginning at the root of the aorta or in the endocardium; and whether the aortic regurgitation is free or not—in other words, whether in the special case under observation, the lesion is serious or not. Do not, however, let it be supposed that I wish to discourage the attendance of junior students altogether. All I want to point out is, that the special plan of examination and instruction, which I adopt, is better fitted for seniors than for juniors. There is always a good deal which the beginner can understand; and, although he cannot get the full benefit which a senior student can, yet a certain amount of time passed here will not be mis-spent; if he were to acquire nothing else, he cannot fail to get many valuable hints as to the methods of eliciting information, examining, managing, and dealing with patients.

In concluding this part of the subject, let me say, that in advocating, as I have done, the claims and advantages of the out-patient department as a field for clinical study, I have not the remotest intention or wish to appear even to depreciate the claims and advantages of the in-patient department. Out-patient practice is merely supplementary, for although it fills up a gap and enables you to see certain forms of disease which are not always met with amongst the in-patients, it is, and always will be rightly considered as subordinate and secondary. No one appreciates more than I do the importance of ward work; in short, the wards of the hospital are the places where you ought to learn your medicine, and do the chief part of your medical work.

The out-patient department as a field for original observation.—With regard to the opportunities which the out-patient department affords as a field for original observation, I can unfortunately say little. The time which we can devote to individual cases is so short, that it is seldom possible to make such an exhaustive examination as is required for scientific purposes, or to take full notes. In many cases, we see the patient only once; the important and interesting cases are always, if possible, sent on to the wards, and those who do not wish to come into the hospital, very often do not, or are not able to come back. Original clinical observation can only be adequately carried out in the wards of a hospital. Personally I am only too conscious of this; for the first ten years of my professional life I was fortunate in holding hospital appointments which afforded me an abundant field for original work, and now, when I am much more able to make use of such advantages and to do really good work, I unfortunately cannot command them.

APPENDIX II.

On the question of communicating the opinion which the physician forms to the patient and his friends.[1]

HAVING arrived at a diagnosis, the next point which the physician has to determine is the prognosis; in other words, he has to form a conclusion or forecast of the probable course, duration, and termination of the case. He must form an opinion as to the probable result—whether it is likely to end in recovery or death; as to the complications which are likely to occur, and how they are to be guarded against. If he believes that the patient will recover, he must consider whether the recovery will be complete or not; whether the disease is likely to recur; and if so, what are the conditions which are liable to reproduce or re-excite it, and how they are to be guarded against and prevented. If recovery is incomplete, he must determine whether the after effects which remain will be likely to interfere with the patient's comfort or happiness; whether they will unfit him for his occupation (if he be an adult and has an occupation), or make it advisable that he should select some special business and occupation, and not select others which might perhaps, if he had remained perfectly healthy, have been selected for him; what are the special risks and dangers to which his impaired condition of health will predispose him, and how are they to be guarded against and prevented; whether it is advisable that he should or should not marry; how, in short, he should regulate the whole course and tenor of his future life.

Now in trying to form an opinion on these points, the same facts which determined the diagnosis must necessarily be again taken into account, for, the exact nature of the disease, its pathological character and extent, the rapidity with which it is progressing,—all of which have already been determined in forming the diagnosis—are essential elements in the prognosis. We know, for example, as the result of observation and the accumulated experience of authorities, that the tendency of acute croupous pneumonia is to terminate either in death or in complete cure; that a double pneumonia is more likely to end fatally than a single pneumonia; further, that an apex pneumonia is more likely to end in incomplete resolution and phthisis than a pneumonia beginning at the base.

Since then the prognosis is to a large extent based upon the same facts as the diagnosis, the more accurate and exhaustive the examination of the case, the more accurate will be the prognosis.

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[1] Being part of the Introductory Lecture delivered to the Author's class at the commencement of the Winter Session 1886–87.

But in order to form an accurate prognosis or forecast of each individual case, it is necessary not only to take into account the facts on which the diagnosis is founded, and to have a knowledge of the natural history, so to speak, of the special disease with which the patient is affected, but also to take into account the special peculiarities of the individual patient. In other words, we have to consider in each individual case the patient's capability of resisting the disease and his powers of compensation,—and in order to determine these points we have to take into account a variety of circumstances, such as (1) his age, strength, diathesis, hereditary tendencies; (2) the presence of associated disease; (3) his habits, circumstances, and surroundings; (4) the effects of treatment; and (5) in some, more especially chronic cases, the progressive or stationary character of the lesion.

The prognosis is, in short, the diagnosis, specially applied to the individual patient, and in order that it may be accurate it is necessary that the physician should be acquainted with the usual course and tendencies of the disease with which the patient is affected.

Time does not permit me to go into detail with regard to all these points, but illustrations of what I mean will doubtless occur to most of you. I am anxious, however, to consider a little more fully the next point, viz., *the advisability of communicating to or withholding from the patient the opinion which the physician may form regarding the case.*

The question is one of the greatest practical importance; and it is a question which you will have to decide every day in practice, for in all ranks of society the patient and his friends naturally wish to know, as soon as you have completed your examination and made your diagnosis, what is your opinion as to the gravity of the case.

Now the answer to the question—whether you should or should not communicate the opinion which you have formed to the patient—depends chiefly, I think, upon the following circumstances:—

1. The nature of your opinion, whether favourable or the reverse.

2. The nature of the disease, more especially whether it is acute or chronic.

3. The mental temperament and disposition of the patient.

A. It may be stated as a general rule that, *when the opinion is favourable,* it should be immediately communicated to the patient.

The only exception to this rule is, I think, the case in which it is necessary to act upon the fears of the patient; in other words, to make him suppose that his condition is more serious than you really think it to be, in order that you may induce him to alter his habits and mode of life, and carry out your instructions with regard to treatment; as, for example, when the patient is taking too much alcohol, or giving himself up to any other excess.

The beneficial effect which a favourable opinion produces upon the patient's mind, and upon his general condition is often most striking. It is in fact, in many cases, the very best tonic and restorative which can possibly be administered, and in some cases is much more powerful as a curative agency than all the drugs of the pharmacopeia.

We all know what an all important influence the nervous system exerts on the processes of nutrition, growth, and repair; how the mind, to speak in popular language, acts upon the body and the body on the mind; how, when the mind is depressed and filled with gloomy forebodings or fears, the functions of all the great viscera are apt to be performed in a languid and sluggish manner, the whole vital tone deteriorated, the resisting power of the organism weakened, contagious and infectious diseases, cholera for instance, more likely to be contracted, and the processes of repair and recovery from disease which is already present seriously interfered with or altogether prevented; how easily persons of a cheerful, hopeful, and sanguine disposition throw off their ailments; how, on the one hand, a patient who firmly believes that he will get well, often does get well, even in apparently hopeless circumstances; and how, on the other, a patient who is impressed with the idea that he will die, often does die, even when we might have expected recovery.

Further, there is reason to suppose that every impression which is received by a sensory nerve is reflected and reverberated, as it were, through the whole nervous system, and exerts some influence, unfelt it is true, slight no doubt, it may be almost infinitisimal, but still an influence, upon every individual tissue and organ—witness, for example, the experiments of Mosso and Pellicani, which seem to show that contractions of the muscular wall of the bladder—a very 'coarse' effect—not only result from stimulation of any sensory nerve, but also accompany every *psychical act*, whether intellectual, emotional or volitional. Further, we know that the fixed belief that an organ is diseased, and the concentrated attention which it then receives, may actually produce tangible and perceptible functional disturbances, as, for example, the fibrillary twitchings, which, if not actually produced in the first instance, are certainly, I think, exaggerated, when a medical man or medical student, who is perhaps a little run down in health, thinks he is the victim of progressive muscular atrophy, and the palpitation and uneasy sensations in the region of the heart, which are so common in those who fancy they are affected with organic cardiac disease.

Now picture to yourselves the mental condition of the patient who comes to consult a doctor; try to realise, if you have not actually done so in your own persons, the immense effect which his opinion will, in many instances, produce on that patient's mind; and you will have no difficulty in understanding the tremendous influence—I can use no minor term—which that opinion will, in many instances, produce upon the organism, and hence upon the pathological condition (in some cases directly as in many functional derangements, and in others more or less indirectly, as in some organic conditions).

I repeat that a favourable opinion, confidently expressed by a physician in whom the patient places implicit trust is, in many cases, the most potent tonic and restorative which it is possible to administer. In some instances, as for example, in many cases of functional derangement (the functional fibrillary twitchings which I have previously mentioned, many forms of functional derangement of the heart, some cases of hysterical disease, even hysterical paralysis), it is the only medicine which is required, and is of itself sufficient to effect a cure. It must, however, be remembered that in many cases the effect is only temporary, and that it is generally advisable to keep up the tonic influence by the administration of remedies—coloured water being, in many instances, all that is required.

But even where the patient is actually suffering from severe organic disease, the beneficial effect is often most striking,—and in some cases, where life is hanging in the balance, as for instance in some acute diseases, the opinion of the doctor may turn the scale, and death or recovery may depend upon the effect which it produces upon the mind of the patient.

But in order that a favourable opinion may produce this tonic and restorative effect, it is essential that it should be expressed with confidence, and that the patient should thoroughly believe in it. And here let me say in passing, that there is no quality which is more conducive to success in practice than the power of impressing patients favourably, and of creating confidence. I cannot too strongly urge you to do your utmost to cultivate and elaborate this faculty, for it can, to a large extent, be improved and cultivated. It is perfectly true that there are great natural differences in individuals in this respect. To some extent the power of inspiring confidence is a matter of 'manner' and 'address,' but to a still greater extent it depends upon the confidence which the practitioner feels in himself. Now self-confidence is of two kinds. There is, on the one hand, that self-confidence which is due to mere self-assurance—and that the arrant quack who is totally ignorant of the mere elements of medicine can, by dogmatic opinions, the result of mere self-assurance, and by the administration of some inert and harmless nostrums in some cases cure (functional) disease, is one of the most striking illustrations which can be adduced of the effects which may be produced on the body through the mind—and, on the other hand, there is the self-confidence which is based on the sound foundation of experience and knowledge.

Let me bring these points home to you by means of an illustration. The differential diagnosis of functional (hysterical) and organic paraplegia is, in some cases, attended with great difficulty; and in order to cure a case of hysterical paralysis, it is essential to impress the patient with the conviction that you can and will cure her. Now unless you feel sure of your diagnosis, you will not be able to give a positive and confident opinion; hysterical patients are, as a rule, extremely acute, and if you show the least indecision, if you do not speak with the greatest confidence and assurance, they will almost certainly detect your doubts. Hence, if you are to cure cases of hysterical (functional) paralysis, you must be able to distinguish them from cases due to organic disease.

The power of inspiring confidence is absolutely essential to the consultant, who, in many cases, only sees the patient once, but is no less valuable in every form of practice. I repeat that knowledge and experience are its only true foundations. A good manner and address are also most helpful to success, but not essential; for when a doctor becomes known to his patients, when they have found by experience that he is a really able man, that he knows his work, and that he is able to treat them satisfactorily; but above all when they have, as it is popularly termed, been pulled through a severe illness by him, they no longer notice his want of manner and address, or at all events are not made uncomfortable by it. It must, however, be acknowledged that a man with a bad manner is heavily handicapped, more particularly when he first commences practice.

B. When the physician takes an *unfavourable view* of the case, it is perhaps more difficult to decide whether the opinion should or should not be communicated to the patient. The decision should, in my opinion, be determined chiefly by the nature of the disease—whether it is acute or chronic—partly, but this I think chiefly applies to chronic cases, by the mental temperament of the patient.

In the case of acute disease, occurring in a previously healthy person, I am disposed to lay it down, as a general rule, that an unfavourable opinion should not be communicated to the patient; indeed, I go further than this and say, that it is the duty of the physician in most cases of *acute* disease occurring in a previously healthy person, to communicate a favourable opinion to the patient, even when he believes in his own mind that the chances are all against recovery. I am speaking, be it observed, of the *immediate* prognosis (of the patient's getting better or dying of acute disease), and not of the *secondary* or *remote* prognosis (of the probability if he gets better, whether there will be complete restoration to health, or more or less permanent disablement).

One of the most striking differences between acute disease and many chronic affections is this, that acute affections, acute croupous pneumonia, for example, tend either to death or recovery, and that even in the most severe and apparently hopeless cases recovery not unfrequently takes place; whereas in many chronic affections there is little or no tendency to recovery, and we know as a matter of fact, that when the disease is far advanced, death must result; it is only a matter of time; we know in short, in many chronic affections, such as phthisis, cirrhosis of the kidney, aortic incompetence, etc., that when the process of destruction has advanced to a certain degree—which we can, as it were, measure and ascertain by careful clinical investigation—that recovery is no longer possible.

In many acute affections it is, in fact, literally true that 'while there is life there is hope.' In such cases, unless the patient is actually *in articulo,* the most able and experienced physician is not justified in saying that the patient *can not* get better; all he is justified in saying is, that the condition is so grave that *in his opinion* the patient *will not* recover; in other words, that in his opinion the chances are strongly against recovery; he is not justified in excluding the possibility of recovery altogether. It must of course be understood that these statements apply to those cases in which the patient has been previously healthy—more especially to children and robust adults, whose vital and recuperative powers are still in full activity.

Now just as a favourable opinion produces in many cases a most beneficial tonic and restorative effect, so the effect of an unfavourable opinion is, in others, most deleterious and depressing. And since it is the duty of the physician to do everything in his power to prolong life, and since, in some cases of acute disease it is impossible, however severe and apparently hopeless the condition may appear, to absolutely exclude the possibility of recovery, I hold that it is the bounden duty of the physician to administer the mental restorative of a favourable opinion, even when he is convinced in his own mind that the chances are strongly against recovery—just as it is his duty to administer alcoholic stimulants or any other remedies.

I repeat that in some cases of acute disease where life is hanging in the balance, the effect which the opinion of the physician produces on the mind of the patient, is of itself sufficient to turn the scale, and to determine whether death or recovery shall take place. Further, I say that so long as the patient is not actually *in articulo*, it is impossible, in cases of this description, to be absolutely certain that recovery cannot take place. Under such circumstances I consider it my duty to buoy up the hopes of the patient; and I will not take upon myself the responsibility of diminishing the chances of recovery by depressing him with an unfavourable opinion even when I am convinced in my own mind that the chances of recovery are exceedingly small.

But you may perhaps ask, When a patient is dangerously ill, and probably about to die, is it not right, even at the risk of depressing him, and it may even be, in some cases, of seriously diminishing his chances of recovery, to tell him plainly his danger, in order that he may make repentance of his sins, and prepare himself for a future state? That question is one which it would be out of place to discuss here, even if I felt myself fitted to consider it. But I may say that the peace of mind and tranquillity of soul which so frequently result from the visit of a clergyman may be, even from a mere medical point of view, eminently beneficial and helpful to the patient. Far then from discouraging, I would—when the patient desires it, or when the visit of a minister is likely to produce rest and tranquillity of mind—encourage the visit of the clergyman, but I would only do so with the distinct proviso that the minister of religion should be a judicious man, and that in his intercourse with the patient he should, like the doctor, take care that he does nothing and says nothing which is likely to prejudice the patient's chance of recovery. While affording the consolations of religion, he, like the doctor, must take care not to depress or exhaust the patient, and he must endeavour to buoy up his hopes with regard to recovery. I see no reason why the ministration of the clergyman should be one whit less beneficial and effectual in a religious point of view, when he sustains the hopes of the patient and induces him to think that he will get better, than when he leads him to suppose that he is going to die.

Then there is the question of making a will, which every now and again comes up in cases of acute illness. A patient who is seriously ill, and who is pressed to make his will and arrange his affairs, may not unnaturally suppose that the doctor thinks he is going to die. Now the mental depression produced by such a supposition may, as I have so frequently pointed out, be very prejudicial, and should therefore be avoided; still, it must be remembered, that the physician has not only to consider the welfare of the patient, but also of his wife and family; and it might, I think, in some cases be fairly argued, that where the chances of recovery seem small, it is better to run the risk of depressing the patient, and of possibly prejudicing his chance of recovery—which, be it observed, is very small—rather than to incur the risk—which is very great—of allowing a serious and permanent injury to be done to his wife and family. Fortunately, however, the question does not require to be considered in the way that I have stated it; for in urging a patient to make his will it is not necessary to tell him, or even to lead him, to suppose that he is going to die. With a little tact and judicious management the patient may be got to settle his affairs, while at the same time he is impressed with the idea that he will recover. It is of course necessary to tell him that he is seriously ill, but that he knows already (exceptions to this statement are every now and again met with). In advising him to make his will, you should tell him that you do so in order to guard against accidents and possibilities, and as a precautionary measure; that while you cannot, of course, say that there is no risk of the case taking an unfavourable turn, you have every hope of his recovery; and that you do not in any way mean to imply that you think he will not get better. When judiciously put in this way, the effect is often beneficial rather than prejudicial. It must be remembered that many men are very reticent about their affairs; and it is probable that some men who have not made a will or other necessary arrangements, suffer much mental anxiety without expressing it, and without taking any steps to have their affairs settled. Now, in cases of this description, the mental relief which follows a settlement is eminently beneficial; and even if the patient is not feeling any mental anxiety about his affairs, or if he is so ill that he is beyond feeling any anxiety, the getting him to make his will—provided that the matter is judiciously gone about and managed—need not produce any mental depression, or in any way prejudice his chances of recovery.

But while, in my opinion, it is not advisable, as a general rule, to communicate an unfavourable opinion to a patient who is suffering from acute disease, the true state of matters must be communicated to the patient's friends and relatives. Here again, tact and discrimination on the part of the physician are necessary. It does not do to communicate an unfavourable opinion to every body. In many cases, it is advisable, in the first instance at all events, to make the communication in a very guarded manner; this is especially necessary when the patient's friends and relatives are of an emotional and nervous temperament. In all cases, it is advisable to insist upon the necessity of self-restraint, and of maintaining a cheerful and hopeful appearance in the presence of the patient. Further, the physician must remember that the friends and relatives are much more likely to over- than to under-estimate the gravity of the case; and that it is just as much his duty to relieve, so far as he consistently can, their mental distress and anxiety as to relieve the sufferings of the patient. While, then, the gravity of the condition should not be under-estimated and made light of, the physician should endeavour to maintain a cheerful appearance, and so long as there is a chance of recovery, to sustain the relatives and friends of the patient with the stimulus of hope.

C. Let me now pass to those cases in which the disease is *chronic* and in which the opinion of the physician is *unfavourable.* Here the opinion ought, I think, as a general rule, to be frankly communicated to the patient. Tact and discrimination are again essential in making the communication.

In some cases it is not advisable to communicate the full gravity of the condition at the first visit, but to make the communication by degrees. It is only in those exceptional cases, in which it is necessary, for reasons which have been previously stated, to work on the fears of the patient, that the communication should be made abruptly and in full force. In dealing with very nervous persons, it is occasionally, though I think rarely, desirable to minimise as much as possible the gravity of the condition.

The following case, which occurred in the practice of my father, illustrates the injury which may be done by injudiciously communicating a grave opinion to a person of a highly nervous and anxious disposition; it further shows one of the difficulties which meet the consultant who sees the patient for the first time, and knows little or nothing of his character and mental temperament; and teaches the importance of the ordinary medical attendant being present at the consultation, or of his sending a letter to the consultant with the patient; further, it shows the advisability of a consultant communicating his opinion, wherever it is possible to do so, through the ordinary medical attendant rather than directly to the patient. The following are the particulars of the case:—A gentleman of an extremely nervous and anxious disposition had, for many years, presented a well-marked mitral murmur. The lesion was a stationary one, and my father being well acquainted with the mental constitution of the patient, had deemed it prudent to withold the information from him, guarding himself, however, against accidents, by explaining to the patient's brother the exact nature of the case. The patient, when passing through Edinburgh on his way to the Highlands—it is now many years ago—felt a little out of sorts. He consulted a physician—now long dead—who told him that he had heart disease. The poor man was thunderstruck; he at once gave up his holiday, and returned home in a state of great mental agitation and distress. He continued to pass a miserable existence for some time afterwards; and my father told me that not only did he never quite forgive him, although the true circumstances of the case were carefully explained to him, but that he never was so cheerful and happy as he had been before; in fact, that he was an altered man for life.

The reasons why it is desirable to communicate frankly and fully, though with due tact and discrimination, an unfavourable opinion to the patient, affected with chronic disease, are as follows:—

In the *first* place, there is not the same uncertainty with regard to the prognosis as in cases of acute disease. We can, as I have previously pointed out, be perfectly certain, in the advanced stages of many chronic affections—as for example, phthisis and aortic regurgitation—that recovery is quite impossible

In the *second* place, there is no object to be gained, as there so often is in the case of acute disease, in withholding the true state of matters from the patient. In persons of a very anxious and nervous temperament, this general rule has, as I have already pointed out, sometimes to be departed from.

In the *third* place, it is often absolutely essential that the patient should know the exact nature of his condition and the gravity of the case, for otherwise he may not be able to intelligently carry out the instructions as to treatment; he may not live so quietly and temperately; and he certainly will not guard himself so carefully as he ought to do against conditions which are likely to aggravate his complaint or produce complications. The necessity, in cases of aortic aneurism, of fully explaining to the patient the exact nature of the disease, its risks, and how they are to be guarded against, will be apparent to every one.

In the *fourth* place, it must be remembered that even if the patient should at first be much depressed by the unfavourable opinion which he receives, the depression, as a rule, soon passes off; and the injurious effect on the condition of his tissues is, in many cases, only temporary; the mind becomes, as it were, accustomed to the idea, and ceases after a time to be injuriously affected by it. No better illustration of this fact could be given than the case of a medical man affected with aortic regurgitation. When he first learns the nature of his condition, he may, for a time, be haunted with the idea of sudden death, knowing that that accident does result in some cases of aortic incompetence; after a time, however, the injurious impression passes off; the idea has perhaps become so habitual, that it no longer occupies a prominent position in consciousness; and since the dreaded result does not happen, the patient, fortunately for himself, gets into the way of thinking that it will never happen.

In those conditions, such as advanced aortic regurgitation, in which there is a tendency to sudden death, it is usually, I think, advisable to place the danger in a very guarded manner before the patient. On the one hand, it should be remembered that sensible and intelligent people will avoid over exertion and other conditions likely to induce syncope, quite as strenuously if they are told that such conditions are likely to produce serious aggravation of the cardiac mischief, as if they are told that sudden death may result therefrom; while, on the other, the knowledge that there is at any moment a liability to sudden death does, without doubt, injuriously affect some persons.

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